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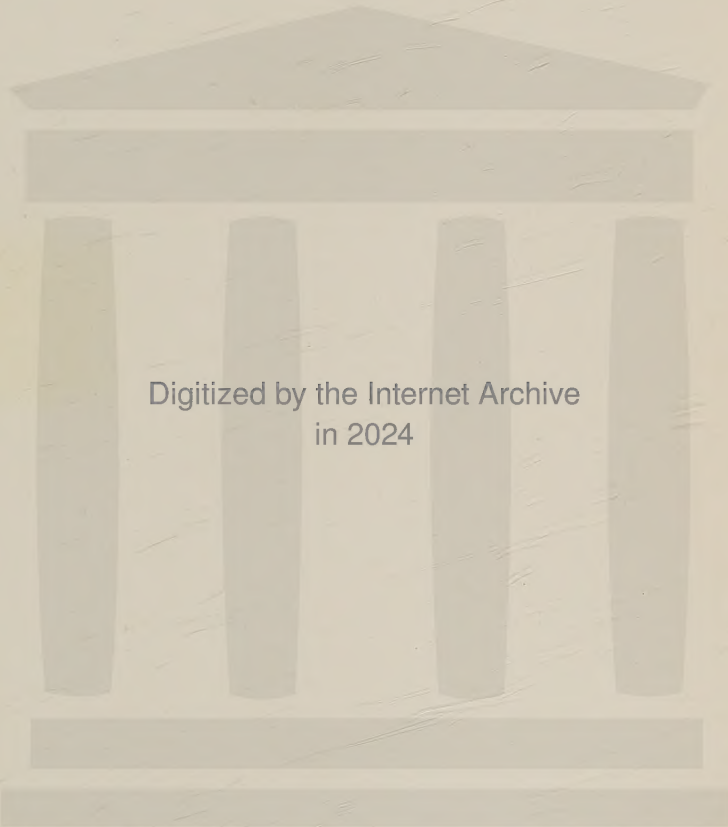
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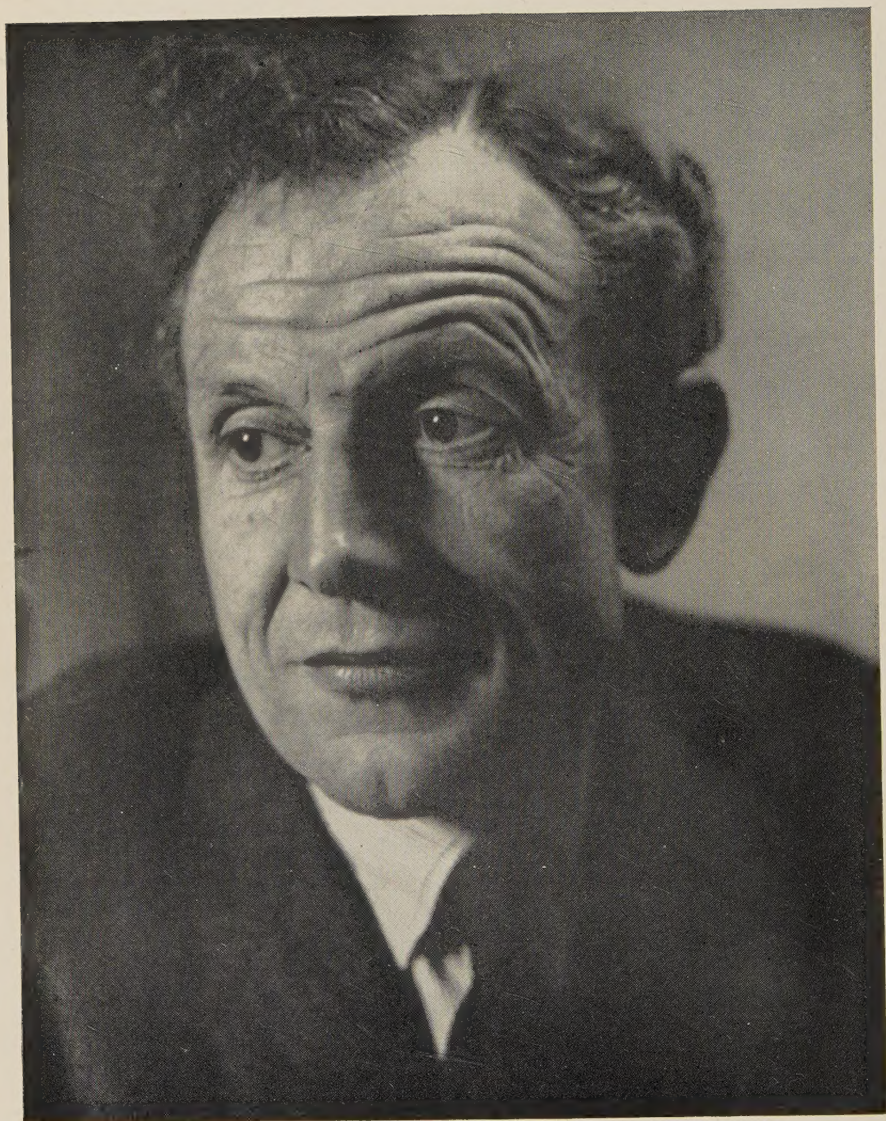
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DR G. C. AINSWORTH
President, 1950

PRESIDENTIAL ADDRESS

A CENTURY OF MEDICAL AND VETERINARY
MYCOLOGY IN BRITAIN

By G. C. AINSWORTH, B.Sc., Ph.D., F.L.S.

The object of our Society is 'the study of Mycology in all its branches' and it is to the history of mycology that many of my predecessors have turned when seeking a subject for the Presidential Address. Many aspects of mycology of widely differing periods have been reviewed. Fungi as pathogens of plants have been dealt with on more than one occasion, but fungi as parasites of man and animals have suffered neglect. It is customary for a president to choose a subject on which he is an acknowledged authority. I can make no such claim. I owe my recent introduction to medical mycology to the Wellcome Trustees, by whose generosity I was enabled to devote a sabbatical year to the subject. This afforded me an opportunity of compiling a list of fungi pathogenic for man and other vertebrates as a contribution to the census of the fungi recorded for Britain which is being taken under the Society's auspices. When engaged on that task I found myself disturbing the dust on volumes which had not been opened by a mycologist during the present century. I became familiar with the work of mycologists whose names were at first as unfamiliar to me as the fungi which they studied. It is my intention to-day to pay tribute to these pioneers.

The beginnings of medical mycology can be dated with fair precision but, as so frequently with new developments of science, it is less easy to allocate the credit to individuals. When the climate of opinion becomes favourable or when there is an advance in technique, critical discoveries are made independently and almost simultaneously by several workers. Poisonous fungi have been known since classical times. It was not, however, until the fourth decade of the nineteenth century that the causal relationship of fungi to disease in animals and man was recognized, a discovery which mycologists do not always realize antedated the recognition of fungi as pathogens of plants. In 1835, eleven years before Berkeley concluded of potato blight that 'the decay is the consequence of the presence of the mould, not the mould of the decay', Agostino Bassi [1773-1856], of Lodi near Milan, offered experimental proof that the 'muscardine' disease of silkworms is caused by the fungus now known as *Beauveria bassiana* (Bals.) Quill. and so provided the first example of one living organism causing disease in another. This discovery, coupled with the more general use of better microscopes, quickly resulted in the description of fungi associated with other diseased conditions. In 1839, J. L. Schoenlein [1793-1864], of Zurich, announced the mycotic nature of human favus, and six years later Robert Remak [1815-65], who had seen the fungus of favus in 1837 without

appreciating its significance, proposed the genus *Achorion* to accommodate Schoenlein's fungus. F. T. Berg [1806-87], of Stockholm, in 1842, reported his experiments with the thrush fungus which was independently described in the same year by Gruby who is now seen to have been the outstanding 'man of his time'.

David Gruby [1810-98] was a Hungarian Jew. He studied medicine in Vienna and in 1840, rather than submit the certificate of baptism necessary for a professorial chair, migrated to Paris. During the next four years, in addition to his observations on the thrush fungus, he described, in a series of short papers to the Academy of Sciences, the fungi associated with four of the principal types of ringworm. In the first paper, published in 1841, Gruby established the cause of favus and the next year clearly described the ectothrix species of *Trichophyton* responsible for 'mentagre', or ringworm of the beard. By 1843 he had turned his attention to head ringworm in children and gave an account of the parasite which he named *Microsporum audouini* (in honour of Jean-Victor Audouin [1797-1841] of the Paris Natural History Museum, noted for his researches on the muscardine disease of silkworms), and in the following year completed the series with a description of the endothrix fungus of tinea capitis (which was discovered independently and named *Trichophyton tonsurans* by P. H. Malmsten [1811-83] in Sweden in 1845). Gruby then turned his attention to other topics, and about 1850 gave up research for private practice, leaving the names *Oidium albicans* [*Candida albicans* (Robin) Berkhout] and *Microsporon mentagrophytes* [*Trichophyton mentagrophytes* (Robin) Blanchard] to be proposed by Charles Robin [1821-85] in his *Histoire naturelle des végétaux parasites qui croissent sur l'homme et sur animaux vivantes*, 1853; a monograph which gives a comprehensive picture of the state of knowledge at that time and which, as others have pointed out, contains no reference to bacteria.

DERMATOPHYTES

In this country, as elsewhere, it is the Dermatophytes or Ringworm Fungi which provide the main theme for the student of nineteenth-century medical mycology, and it is possibly as true to-day as it was a hundred years ago that among all the diseases to which the skin is liable none excites more interest or is the cause of more alarm on its appearance, 'whether in public seminaries, or private families', than ringworm of the scalp.

The use of the term 'tinea' (from a fanciful resemblance of the signs of the disease to the depredations of the clothes moth) and its anglicized equivalent 'ringworm', date from the fourteenth to fifteenth centuries.*

Early medical writers used 'tinea' in a generic sense for a miscellaneous assortment of diseases, and so Robert Willan [1757-1812] and his pupil

* The earliest use of *tinea* cited by *The Great Oxford Dictionary* is that by John de Trevisa [1326-1412] in *Bartholomeus de proprietatibus rerum*, VII, iii, 1398 (Bodl. MS.): 'þe heed is ofte disressed with an yuel þatt children haue ofte... and we clepith þ yuel Tinea a moppe, for it freetep and gnawwith þe oure parties of the skynne of þe heed as a moppe freteþ cloop.' An early use of *ringworm* is in the pre-Tudor morality play *Mankind*, c. 1450: 'I haue a lytyll dishes [= disease]... wyth a runnyng ryngge-worme', according to the same authority.

Thomas Bateman [1778-1821], who did much to rationalize the nomenclature of dermatology, rejected the name *tinea* as 'a term of no authority and probably of Arabic origin' and revived the classical, and in their opinion more precise, generic appellation 'porrigo';* at the same time taking over some of the earlier specific epithets of which *favosa* (from a likeness of the favic crusts to a honeycomb) survives in the name *favus*. Willan and Bateman's classification also proved to be defective. *Porrigo* was never wholly acceptable and the generic use of *tinea* was later again taken up for the modern nomenclature of the ringworm complex on a topical basis, e.g. *tinea capitis*, *tinea corporis*, *tinea pedis*, and so on.

In Bateman's opinion (Bateman, 1813, p. 169) ringworm of the scalp seemed 'to originate spontaneously in children of feeble and flabby habits, or in a state approaching marasmus, who are ill fed, uncleanly, and not sufficiently exercised'. That is to say, he believed the disease to be constitutional. Samuel Plumbe [? -1837], the author of the popular *Practical treatise on diseases of the skin* . . . , 1824, thought otherwise, although he believed the constitution to be a major factor in *favus*. From his own observations and experiments, Plumbe confirmed the views of others that ringworm of the scalp and *favus* were contagious. He was the first to recognize the connexion between head and body ringworm, and his recommendations for treatment were enlightened. But the views expressed by Bateman were difficult to eradicate. In the fourth edition of his *Treatise*, published in 1837 towards the end of the pre-Gruby period and after Bateman's death, Plumbe still thought it necessary to refute with vigour the suggestion that the occurrence of body ringworm in several children of one school or family should be attributed 'to the season or some other common cause' (Bateman, 1813, p. 231), and in spite of the accumulating evidence to the contrary the constitutional explanation lingered on for another thirty years. Finally, when the evidence for the implication of fungi as parasites became overwhelming, this hypothesis influenced opinion on the identity of the fungi themselves.

The first observations and illustrations of a ringworm fungus to be published in this country were by John Hughes Bennett [1812-75] who, early in 1842, read a paper to the Royal Society of Edinburgh on 'Parasitic vegetable structures found growing on living animals' (Bennett, 1842). This included an account of 'Observations of the Mycodermatous Vegetations constituting the crusts of *Tinea favosa* . . .' confirming Gruby's findings on the same topic which had been announced in the previous summer. In addition to describing the appearance and development of the favic crusts Bennett attempted the experimental infection of the neck of the affected child and of his own arm and scalp but the results were negative and so he concluded it to be probable that the vegetations associated with pathological states 'always arise in living animals *previously* diseased'. Three years later this view had to be modified for, as a result of successful experimental infections made by Remak, also in 1842, one of the gentlemen in attendance at Bennett's polyclinical class at the Royal Dispensary, Edinburgh, during the summer of 1845 volunteered to permit his arm to be inoculated.

* From the Latin *porrigo*, to spread; or *porrum*, a leek, because of a leek-like smell or the lamellated structure of the scales.

This time the results were positive. Typical favus spots developed (Bennett, 1858, p. 799).

It was Gruby in 1843 who first formally recognized a new class of vegetable parasitic diseases, which he proposed to call 'phytoparasites', to accommodate 'la teigne faveuse' (favus), 'phytomentagre' (tinea barbae), 'mouget' (thrush), and his latest discovery 'phytoalopécie' (tinea capitis caused by *Microsporum audouinii*), but by associating this last disease with porrigo decalvans or alopecia, a non-parasitic baldness, Gruby did much both to discredit his own work and confuse his successors. Most investigators were less progressive. In France, A. P. E. Bazin [1807-78] advocated the acceptance of the parasitic origin of ringworm, but in 1850 A. Cazenave was warning dermatologists against 'the illusions of micrography' and denying the presence of 'any pathogenic properties in the mysterious atoms' of *Achorion schoenleini*, the only fungus which he recognized (Morris, 1898). In Britain, likewise, opinion was divided. Sir William Jenner [1815-98] adopted the parasitic view of skin infections and thought that the simple way to effect a cure was to destroy the fungus by some topical application. 'But the error soon betrayed itself to his mind and he candidly acknowledged that this mode of treatment ended in disappointment' according to Jabez Hogg [1817-99], a constitutional die-hard, who in 1873 reprinted in book form a series of papers published some years earlier fulminating against the parasitic theory of disease or, when the involvement of fungi in skin disease became indisputable, advocating the view that variations in these diseases were due to differences in the constitution modifying the soil for one essential fungus (Hogg, 1873).

The first English text on pathogenic fungi available in this country was the translation of Kuchenmeister's *Manual of animal and vegetable parasites*, 1857. In the second volume of that work the principal fungi hitherto described from man are compiled with germanic thoroughness by an author who believed that fungi played a parasitic role. The first book dealing with the fungi of medical importance to be written in this country was *Skin diseases of parasitic origin... including the description and relations of the fungi found in man*, 1863, by W. Tilbury Fox [1836-79]. This work contains little original mycology (Fox acknowledges his indebtedness to Kuchenmeister for descriptions of the various fungi), and its chief interest lies in the presentation of the evidence that there was but one essential fungus—in Fox's opinion *Torula* sensu Turpin [yeasts such as *Torulopsis* and *Saccharomyces*], at least as far as the mucedinous fungi were concerned for he was 'most desirous not to ride any hobby'. The two main reasons for this view of the dermatophytes were first, that in parasitic life in the skin and to a less extent in hair the different dermatophytes appear similar to the casual observer; and secondly, that the introduction of cultural methods without taking steps to ensure the purity of the cultures led to the fantasies associated with the name of Ernst Hallier, who in 1863 made the minor claim that the favus fungus was a form of *Penicillium crustaceum* Fr. Some years earlier, J. Lowe [1830-1902], of Edinburgh, concluded that *Trichophyton tonsurans* was a spore form of the favus fungus and that both were forms of *Aspergillus glaucus* (Lowe, 1858), and Tilbury Fox was able to quote the Rev. M. J. Berkeley's unqualified approval of this finding. Not everyone, however,

was convinced. As Thomas Hillier [1831–68] pointed out, ‘... these facts do not... prove the identity of fungi... they seem to show that a soil which is favourable for one fungus may encourage the growth of another distinct fungus’ (Tilbury Fox, 1863, p. 177) and Thomas M’Call Anderson [1836–1908] in 1861 had recognized four cutaneous affections (favus, tinea tonsurans, pityriasis versicolor, and, following as he thought Gruby, alopecia areata) each of which he believed to be due to the presence of a distinct vegetable parasite (Anderson, 1861). In this country it was George Thin [? –1903] who showed by careful cultural work on a variety of liquid media and on the ‘meat-gelatine’ recently introduced by Koch that *Trichophyton tonsurans* is a fungus in its own right ‘totally distinct from the common fungi whose spores infest all the objects by which we are surrounded’ (Thin 1881, 1887). Others made similar observations and thus prepared the way for the suggestion by Furthmann and Neebe in 1891 that there was more than one *Trichophyton* fungus and for the publication in the *Annales de Dermatologie et Syphilographie* in November 1892 of ‘Étude clinique, microscopique, et bactériologique sur la pluralité des trichophytos de l’homme’ by Raymond Sabouraud [1864–1938]. Other papers by the same author followed in quick succession, the mycological findings of Gruby were vindicated, and the modern era opened.

Sabouraud’s work attracted much attention and stimulated investigation in England where a series of notable papers appeared in the *British Journal of Dermatology*. The most important of these were those by H. G. Adamson in 1895 and ‘An enquiry into the plurality of fungi causing ringworm in human beings as met with in London’ by T. Colcott Fox [1848–1916, younger brother of Tilbury Fox] and Frank R. Blaxall which appeared in the following year. Adamson (1895) described his very acute observations on the anatomical relations of the parasite to the hair and on the method of infection by *Microsporum audouini* and by ectothrix and endothrix species of *Trichophyton*. He noted that *Microsporum audouini* first infects the epidermal scales of the scalp from whence it passes to the mouth of a hair follicle. Here a mycelial plug is formed from which large ‘ghost hyphae’ (the ‘giant hyphae’ of Fox and Blaxall) grow downwards between the wall of the follicle and the surface of the hair. Some of these hyphae penetrate the hair, branch, and grow downwards into the root, stopping short of the bulb as a ‘fringe’ of delicate hyphae, the so-called ‘Adamson’s fringe’. Others give rise to the mosaic-like sheath of arthrospores which clothe the surface of the hair. The growth of the intra-pilar hyphae is always downwards, the presence of mycelium in aerial parts of the hair being due to the growth of the hair itself. The spore sheath is also renewed from below by the projection of intra-pilar hyphae. The method of attack was found to be similar for *Trichophyton* species, and while subsequently in an ectothrix species an external sheath of regularly arranged spores results, in an endothrix species all external mycelium disappears.

Fox and Blaxall (1896, 1899) confirmed and amplified Adamson’s findings and also reported the incidence of the different ringworm fungi in London where 80–90 % of the scalp ringworm proved to be caused by the small-spored fungus (*Microsporum*). In Adamson’s series at the Middlesex Hospital and the North-Eastern Hospital for children the proportion was

even higher, 171 instances of the small-spored fungus and only seven of the large-spored forms (*Trichophyton*) in 178 successive cases. This distribution is similar to that of to-day and very different from that which prevailed in Paris where 60 % of the head ringworm was caused by species of *Trichophyton* (70 % of the endothrix type) and only 40 % by *Microsporum*. Fox and Blaxall (1896) also gave the first description of the cat ringworm fungus which they isolated from the cat and from a number of cases of tinea circinata [tinea corporis] and tinea capitis in man. Hairs parasitized by this fungus are indistinguishable from those infected by *M. audouini* but in culture the cat ringworm fungus differs from the human *Microsporum* by its more rapid growth, yellow pigmentation, and the production of numerous spindle-shaped macroconidia. Fox and Blaxall rightly recognized its relation to the genus *Microsporum* but left the proposal of a name to Bodin who in 1902 designated this organism, which he had independently isolated from the dog, as *M. canis* a few months before Mewborn proposed *M. felineum* for the cat ringworm fungus in New York.

It was during this period that the first investigations were made on the physiology of the dermatophytes. Leslie Roberts [1860–1949] was inspired by Duclaux's observations on the artificial culture of *Trichophyton* to visit the Pasteur Institute and there studied the growth of *Trichophyton* in liquid media such as saccharine infusion of malt and alkalized beef broth (Roberts, 1889). He took steps to ensure the purity of his cultures and to establish the identity of the fungus which he cultured by inoculating both guinea-pigs and himself. Later, in England, he laid hairs of man, the horse, the dog, and other animals on vigorously growing cultures of 'various human scalp *Trichophytions*' (Roberts, 1895). He noted that some species attack the cuticle and cortex simultaneously, while others first attack the cortex and only later invade the cuticle, if they do so at all, and he thought that this keratolytic activity might be used as a taxonomic criterion for the differentiation of the 'Keratomycetes' (Roberts, 1909). Macfadyen (1894) showed *Trichophyton tonsurans* to liquefy gelatin by enzyme action, and subsequently Leslie Roberts (1899) demonstrated a similar enzyme to be still active in a six-year-old *Trichophyton* culture.

The climax of this interest in the dermatophytes occurred at the Third International Congress of Dermatology held in London during August 1896 when an afternoon session, one of the most important events of the Congress according to the *British Journal of Dermatology*, was devoted to 'Ringworm and the *Trichophytions*'. The symposium was introduced by Dr Sabouraud, who summarized his own investigations and exhibited a series of three hundred cultures, by Prof. Rosenbach of Göttingen, and by Mr Malcolm Morris of London. Subsequent speakers included Charles J. White (Boston, U.S.A.), Leslie Roberts, Adamson, Colcott Fox and Blaxall, and Prof. P. G. Unna from Hamburg, while other contributions by French, Italian, and Spanish workers were made or taken as read. The text of the papers and the discussion occupied more than a hundred pages of the Official Transactions (1898) and Malcolm Morris [1847–1924] later expanded his contribution into a book (Morris, 1898), illustrated by a notable series of photomicrographs. The plurality of the ringworm fungi was established as scientific fact and the main lines for the study of these fungi during the next

fifty years laid down, even if, then as now, not all were willing to accede to 'the infinite series of species which M. Sabouraud asks us to accept.'

During the next decade Adamson and Colcott Fox continued to make important contributions to clinical and mycological aspects of the dermatophytes based on first-hand knowledge of the fungi which they studied. In 1909 Colcott Fox described *Trichophyton sulphureum* (Colcott Fox, 1909), an endothrix species which has stood the test of time; and in 1908 Arthur Whitfield [1868-1947], from independent clinical considerations, differentiated eczematoid ringworm of the hands and feet from the ringworm complex, a condition which had first been noted by Hebra in 1860. Two years later, Sabouraud described the causal fungus, *Epidermophyton inguinale* [*E. floccosum* (Harz) Langer. & Milochev.], the parasitic activity of which is confined to the stratum corneum of the skin. In the course of his investigations on ringworm Whitfield accidentally infected his arm and in curing himself devised 'Whitfield's ointment',* which is still a standard by which other panaceas are measured.

Clinical topics are outside the scope of this address, but mention must be made of the two techniques which have done more than any others to facilitate the control of head ringworm in children. The first of these is epilation by means of X-rays, the second the use of 'Wood's light' for diagnosis.

Microsporum audouini parasitizing the hair of children is notoriously difficult to eradicate. Such infections may linger on until puberty when, for reasons not yet fully understood but probably due to a change in the fatty acids secreted by the scalp, they spontaneously disappear. Treatment with efficient fungicides is often uncertain because of the difficulty of killing the fungus in the hair follicles and the insidious way in which the infection spreads to healthy hairs. Cropping or shaving off the hair, or the manual epilation of infected hairs, accompanied by the conscientious use of fungicidal preparations and precautions to prevent re-infection eventually succeed but at the expense of serious dislocation in the education of children of school age. In 1901, to obviate this educational disturbance, the Metropolitan Asylums Board (which has since been absorbed in the London County Council) established a ringworm school at Bridge School, Witham, Essex (later transferred on a larger and more permanent basis to the Downs School, Sutton, Surrey, and now at the Goldie Leigh Hospital, Woolwich), with Colcott Fox as the visiting dermatologist, where children from London schools could be both treated and instructed. Six hundred to a thousand children, of in 1910, an estimated total of three thousand infected, were

* 'In my researches I managed to infect my own forearm by the jumping of a piece of scale when subdividing it. I discovered it at home on a Sunday, and having nothing much else I scrubbed it vigorously with a tincture of iodine till it bled. Next day I painted an area about twice the size of the ring with pure carbolic acid and of course produced a considerable superficial eschar, yet three weeks later when the scab fell off the ringworm commenced to grow again, and I found the new horny layer riddled with fungus. I then rubbed in an ointment of 5 per cent. benzoic and 3 per cent. salicylic acids in soft paraffin and coconut oil for three days and it disappeared.

I venture, therefore, to recommend the use of this ointment for general use in superficial tinea....'

(Whitfield, 1912, p. 42).

treated annually (Adamson, 1910). The average stay of each child at the school was nineteen months. From 1905, this period was dramatically reduced to four months after the introduction of the technique developed by Sabouraud in 1904* (see Sabouraud, 1906) by which ten days or so after exposing the scalp to a suitable dose of X-rays all the hair falls out or can be rubbed out. This meant that although all healthy hair was shed, so was the diseased, and the new growth was healthy and uninjured.

It was twenty years later that the French workers Margat and Deveze† discovered that *Microsporum*-infected hairs showed a brilliant green fluorescence in light which had been filtered through soda glass containing nickel oxide (first described by Prof. R. W. Wood of John Hopkins University). *Trichophyton*-infected hairs do not fluoresce with the exception of favus hairs which show a similar but weaker fluorescence (Kinnear, 1931). The technique of diagnosis, the manual epilation of infected hairs, and the test of a successful cure were thus greatly facilitated, and combined with X-ray epilation it should be possible to maintain at a very low level, or even to eliminate, *Microsporum audouini* infection in children.

SYSTEMIC MYCOSES

The discovery of the pathogenic role of fungi in skin disease and in thrush led to much speculation as to their implication in the etiology of other diseases and particularly of cholera, epidemics of which were of regular occurrence. Fungus spores or fungus-like bodies were detected in the excretions of cholera patients and during the cholera visitation of 1858 the Rev. Lord S. Godolphin Osborne exposed prepared slips of glass over cesspools and gully holes near the dwellings of those suffering from the disease and caught what he termed 'aerozoa' (Hogg, 1873). The bacteriological discoveries of Louis Pasteur [1822-95], Ferdinand Cohn [1828-98], and Robert Koch [1843-1910] shifted the emphasis away from fungi, but four years before Koch's classical work on anthrax D. D. Cunningham [1843-1914], the author of several papers on plant pathogenic fungi, by experiments to determine whether a correlation could be established between the daily spore content of the air and the incidence of five diseases (ague, dysentery, diarrhoea, dengue, and cholera) in the Presidency Jail, Calcutta, made one of the first scientific studies of the fungus spore content of the air (Cunningham, 1873), a study which with C. H. Blackley's [1820-1900] classical work on hay fever in this country (Blackley, 1873) was to lead to the recognition of fungus spores as one of the air-borne allergens implicated in asthma and similar allergic conditions.

Bennett's 1842 paper provides another starting-point for records in this country. There Bennett described a cryptogamic plant from the sputum of a man who 'laboured under phthisis in its last stage, with pneumothorax' and from the diseased lungs after death. This fungus, which has frequently

* The first X-ray apparatus for ringworm treatment to be used in London was probably that which J. M. H. MacLeod, after a visit to Sabouraud's clinic in 1904, devised with the help of A. E. Dean. The apparatus, which is illustrated in MacLeod, *Diseases of the Skin*, 1923, fig. 19, is now in the possession of the Wellcome Historical Medical Museum.

† *Bull. Soc. Sci. Méd. biol. Montpellier* 6, 375, 1925.

been referred to as '*Oidium pulmoneum* Bennett', although Bennett did not suggest a name, cannot now be identified with certainty. It was possibly a species of *Geotrichum*. The record is, however, the first and very typical example of a long series in which diverse fungi, but particularly species of the genus *Candida*, have been implicated (often on very slender evidence) in respiratory disease.

Apart from *C. albicans* causing thrush, which though well known for so long has only in recent years been the subject of serious mycological investigation, no other endemic 'systemic' mycosis was known in this country until actinomycosis was recognized towards the close of the nineteenth century. For thirty years or so from 1860, however, the so-called 'fungus foot of India' was a topic of much interest. Specimens received from India were subjected to expert examination, and the Rev. M. J. Berkeley's contribution was to describe a now unidentifiable phycomycetous mould found associated with diseased material as *Chionyphe carteri*, in honour of Henry Vandyke Carter [1831-97], Professor of Anatomy and Physiology at the Grant Medical College, Bombay, who made a special study of the disease in India (Carter, 1874), and H. J. Carter, 'an acute observer and physiologist'. It was not until 1894 that Vincent recognized the aerobic actinomycete *Streptothrix maduræ* (now *Nocardia maduræ* (Vincent) Blanchard) as the cause of classical Madura foot; the same year that Kruse proposed the name *Actinomyces israeli* for the anaerobic actinomycete responsible for the various manifestations of human actinomycosis, a disease of world-wide distribution and of common occurrence in this country (see Cope, 1938; Erikson, 1940).

Several of the major systemic mycoses known in other parts of the world have been described in Britain during the present century. The first case of Sporotrichosis (caused by *Sporotrichum schenckii* (Hekt. & Perk.) Matr. which infects the lymph nodes) occurred in 1911 (Walker & Ritchie, 1911), and *Histoplasma capsulatum* Darling, the cause of histoplasmosis, which is possibly endemic and always fatal, was only recognised by Duncan as recently as 1942 (Derry, Card & Wilson, 1942). These two diseases, in contrast to the endogenous moniliasis and actinomycosis of which the causal organisms are harboured by many normal persons, have an exogenous origin. Sporotrichosis is frequently contracted by injury from plant material when gardening and while, on the other hand, the epidemiology of histoplasmosis is obscure, the evidence suggests that the route of infection is usually via the respiratory system. Both these diseases show other interesting features in common. The causal fungi appear yeast-like in the parasitic phase and mycelial under the usual condition of *in vitro* culture. This phenomenon of 'dimorphism', which is exhibited by a number of other fungi responsible for systemic mycoses in man and animals, is possibly due to an inherent potentiality of these fungi rather than to a special adaption for parasitism. It is possible, by suitably adjusting the cultural conditions, to effect the mycelial-yeast transformation at will. The pathological histology of torulosis, another widespread systemic mycosis which has been known in this country since 1930 (Smith & Crawford, 1930), shows a certain resemblance to that of histoplasmosis. Here again yeast-like cells, but markedly encapsulated, are seen distributed throughout the affected tissues of the brain and other

organs, but this pathogen shows no mycelial tendencies in culture and is now classified as *Cryptococcus neoformans* (Sanf.) Vuil.

Among other well-known pathogenic fungi only incidentally recorded in Britain mention may be made of *Coccidioides immitis* Rixf. & Gilchr., the causal agent of coccidioidomycosis, an important respiratory disease in certain parts of North America, by which a laboratory worker was accidentally infected in 1948 (Nabarro, 1948), *Rhinosporidium seeberi* (Wern.) Seeber, the subject of a careful and beautifully illustrated monograph by Ashworth who during 1919-21 studied the nasal polyps caused by this fungus in an Indian student at Edinburgh University (Ashworth, 1923), and *Blastomyces dermatitidis* Gilchr. & Stokes. The last fungus probably originated from packing material of imported goods in the first British case of North American blastomycosis, the report of which by Dowling & Ellsworthy (1925), in addition to providing the first record of the disease outside North America, includes an admirable account of the pathology.

MYCOSES OF ANIMALS

As already mentioned, the first mycosis of animals to be recognized was a disease of insects. Even before that fungi had been noted in association with vertebrates. 'Salmon disease' appears to have the longest ancestry of any animal mycosis in this country since, on 12 May 1748, Henry Baker communicated to the Royal Society of London* a letter he had recently received from William Arderon of Norwich describing observations on a fatal distemper of roach in captivity. '... after this Fish has been a little while confined, the finny Part of its Tail begins to drop off Piece by Piece; and when the finny Part is all gone, a sort of Mortification seizes upon the Tail itself, and gradually creeps along until it reaches the Intestines, at which time the Fish immediately dies'; so wrote Arderon who also described and figured the 'fine fibrillous Substance' which grew out from the mortified tissues. Bennett (1842) noted a similar growth on a goldfish, but the first British records of this disease to be of mycological significance are among those resulting from the serious outbreak of disease among salmon in the rivers Conway and Tweed in 1877. Worthington G. Smith [1835-1917] (1878) in the *Gardeners' Chronicle* attributed the disease to *Saprolegnia ferax* (Gruith) Thuret. T. H. Huxley [1825-95] (1882), in an excursion into mycology as one of Her Majesty's Inspectors of Fisheries, identified the parasite as *S. monoica* Pringsh. There are other more recent records of this not uncommon disease of fish and fish eggs but the relation of the pathogen to *S. parasitica* described by Coker in North America is still obscure and the disease, which is of economic importance, merits re-investigation.

Another disease to be recognized more than one hundred years ago is aspergillosis in birds (caused by *Aspergillus fumigatus* Fresen. and occasionally other species). It was Richard Owen [1804-92] (1832) who, when dissecting a flamingo, found the 'vomicae' in the lungs to be lined with 'a green vegetable mould or *mucor*'. He recognized a parasitic relationship and concluded 'that internal parasites are not derived exclusively from the animal kingdom' and 'that there are *Entophyta* as well as *Entozoa*'. Avian

* *Philos. Trans.* 45, 321, 1748.

aspergillosis is probably the best-known mycosis of animals in Britain, or is at least the one most frequently correctly diagnosed. It is typically a disease of birds in captivity and takes an annual and not inconsiderable toll of birds in the Gardens of the Zoological Society of London and of chickens and other poultry. Birds in the wild are said to be immune, or at least resistant, to aspergillosis but the evidence in support of this view is not very strong and there are a few reliable records of infections in wild birds.

Actinomycosis was first recognized as lumpy jaw in cattle by O. Bollinger and his botanical colleague Carl Otto Harz [1842-1906], who introduced the name *Actinomyces* in the combination *Actinomyces bovis*. Unfortunately, Harz had before him both actinomycosis and actinobacillosis (caused by *Actinobacillus lignieresii* Brumpt) and, like many later workers, did not distinguish between the two conditions. *A. bovis* is now regarded as a *nomen confusum* and there is uncertainty about the name for the organism causing actinomycosis in cattle which is probably distinct from that responsible for human actinomycosis (Erikson, 1940).

Epizootic lymphangitis of horses and other equines which is endemic to countries surrounding the Mediterranean and prevalent elsewhere, was introduced into England and Ireland in 1902-3 by horses returning from the Boer War (Pallin, 1904). In January 1904 the Board of Agriculture and Fisheries drew the attention of Local Authorities to the dangers of this disease, and in the April an Order was issued under the Diseases of Animals Acts. As a result, by isolation of infected animals and by slaughtering, the disease was eliminated within two years and it has not reappeared although it still has the distinction of being the only mycosis of man or animals subject to legal recognition in the United Kingdom. Epizootic lymphangitis is characterized by suppuration of the superficial and subcutaneous lymphatic vessels and the pathogen responsible is another fungus which exhibits dimorphism. On account of its yeast-like characters it was first classified as *Cryptococcus farciminosus* but it is now referred to *Histoplasma* (as *H. farciminosum* (Rivolta) Red. & Cif.), and Bullen (1949), working at Cambridge, has recently determined the cultural conditions for the experimental mycelium-yeast transformation in this species.

Mycoses of animals have in general received much less attention than have mycoses of man, and it has frequently been the investigations of disease in man that has drawn attention to, or elucidated, disease in animals. This is particularly true of the dermatomycoses. Bennett (1842) drew attention to favus in mice but did not describe the fungus and it was not until the early years of the present century that Adamson (1909) confirmed for this country that *Achorion* [*Trichophyton*] *quinckeanum* infects both mice and men. Tilbury Fox's (1871) record of seven cases of ringworm in man contracted from a white pony constitutes the first case of equine ringworm, and three years later the same author recorded sycosis in a coachman caused by *Trichophyton mentagrophytes* originating from a horse (Tilbury Fox, 1873). In 1908, Adamson recorded the same fungus contracted from calves causing body ringworm in man, and about that time the Board of Agriculture issued Advisory Leaflets on ringworm in cattle and on favus in poultry. Favus in poultry is apparently a rare disease in Britain to-day but cattle ringworm is still widespread. In country districts, where *Microsporum canis*

predominates over the human form, *M. audouini*, on the heads of children, *Trichophyton discoides* from cattle is the commonest cause of inflammatory body ringworm in adults.

RECENT DEVELOPMENTS

Recent developments can be only briefly outlined. Between the two World Wars British medical mycology was dominated by Aldo Castellani, who lived and worked for many years in London, and from its publication in 1919 until 1935 the third edition of Castellani and Chalmers' *Manual of Tropical Medicine* provided the standard account in English of the fungi of medical importance. It is difficult to assess the value of much of Castellani's voluminous writings (some sixty papers on medical mycology alone during the inter-war period). His indifferent documentation and the flights of mycological fancy in which he has at times indulged have done much to conceal the fact that he is an original observer. *Trichophyton rubrum* (Cast.) Ota, *Candida tropicalis* (Cast.) Berk., and *C. krusei* (Cast.) Berk. are well-known and important fungi which were first described by Castellani in Ceylon before the First World War. He was also the first to describe *Nocardia tenuis* Cast., which develops as little nodules on the axillary hair of man and which is widespread in the tropics (Castellani & Wilkinson 1923), and one of his clinical successes was the introduction of 'Castellani's Paint' (Castellani, 1928).

Among other contributions made by the British workers at this time mention may be made of the survey of the incidence of ringworm in children attending London County Council schools by Hare and Tate (1927), Tate's (1929) study of the enzymes of the dermatophytes, and the record of Muende and Webb (1937) of *Trichophyton mentagrophytes* (as *T. gypsum-asteriodes*) growing saprophytically on dung in the calf shed of a farm near Oxford. Shrewbury's (1934) monograph on the genus *Candida* and Dagny Erikson's (1935) study of the pathogenic aerobic actinomycetes are also noteworthy, while the short, but scholarly paper by Butler (1937), on *Acladium castellanii*, gives little indication of that author's influence on medical mycology in general. After a medical training, E. J. Butler [1874-1943] turned to the study of fungi, gained an international reputation as a plant pathologist, and in 1920 was appointed as the first Director of the Imperial Bureau of Mycology* at Kew. The primary objects of the new Bureau were to assist workers in this country and, particularly, overseas by acting as a clearing house for all aspects of plant pathology and by helping them to identify the fungi whose ravages they had to control. Butler envisaged that a similar, if more limited, service might eventually be offered to medical men interested in pathogenic fungi,† and in 1925 Sir Arthur E. Shipley and Castellani also advocated such a development in contributions to the *Times*‡. The idea met with a cool response from the medical profession, but from 1923 onwards an increasing number of papers on fungi of medical and veterinary importance were noted in the *Review of Applied Mycology*. Succeeding directors of the

* Later the Imperial (and more recently the Commonwealth) Mycological Institute.

† *Trans. Brit. mycol. Soc.* 7, 171-172, 1921.

‡ 21 August, p. 11, and 1 September, p. 13, respectively.

stitute continued this policy and when in 1942 the organization of the Imperial Agricultural Bureaux was examined by the Hankey Committee* the abstracting of papers on medical mycology was one of the subjects discussed. An approach was made to the Medical Research Council which at once convened a conference to study the question and as one result the Imperial Mycological Institute in collaboration with the Bureau of Hygiene and Tropical Diseases (which notices many of the more clinical papers on medical mycology in its two abstract journals), agreed to issue an annual publication reviewing the literature of medical and veterinary mycology as a whole. The first number of the *Annotated Bibliography of Medical Mycology* appeared in 1944 and thus medical mycologists throughout the world were provided with a most valuable tool.

In the previous year, on the recommendation of the same conference, the Medical Research Council appointed a Committee on Medical Mycology under the Chairmanship of J. T. Duncan, and with R. St John Brooks as secretary) to advise and assist the Council in promoting research in medical mycology. One of the most important causes of misunderstanding between medical mycologists was the chaotic state of the nomenclature of pathogenic fungi brought about in part by defective taxonomy and in part by disregard of the International Rules of Nomenclature and it was expected that the Committee would find itself obliged to consider questions of names. When the original Committee's term expired in 1948 it was reappointed under the chairmanship of Sir Archibald Gray and during the succeeding eighteen months undertook the compilation of a tentative medical equivalent to the Society's *Common British Plant Diseases*. The *Nomenclature of fungi pathogenic to man and animals* (M.R.C. Memorandum no. 23) was published in January 1950 to offer guidance on the names of fungi of medical and veterinary importance and, as for the plant disease list, a number of editors have been invited to respect the recommended names in their publications.

Another and even more important innovation, the official recognition of medical mycology by the Public Health Service, was in a large measure due to the perseverance of J. T. Duncan who, as Lecturer in Bacteriology at the London School of Hygiene and Tropical Medicine from 1920, developed a deep interest in fungi and was for the two years before his retirement in 1949 Reader in Medical Mycology in the University of London. During 1944-5, while in charge of the Winchester laboratory of the Emergency Public Health Laboratory Service, Duncan carried out a survey of the mycoses occurring in this country on behalf of the Medical Mycology Committee (Duncan, 1945), and when the Public Health Laboratory Service was instituted in 1945 a mycological reference laboratory was based at the London School of Hygiene and Tropical Medicine, with a mycologist on the staff. It is there that an official collection of medical fungi was established when the National Collection of Type Cultures was re-organized in 1948.

That concludes my brief survey. Perhaps I should emphasize that it is not an outline of the history of medical mycology in general. Most of the

* *Report on the Imperial Agricultural Bureaux* by a Committee under the Chairmanship of the Rt Hon. Lord Hankey, pp. 38, 1943 (H.M.S.O.).

medical mycology in this country has been derivative; only during the eighteen-nineties and the opening years of the twentieth century have British investigators been in the van of progress. Certain important developments, such as the discoveries in Latin America fifty years ago relating to systemic mycoses, passed almost unnoticed here, as did the mycological achievements of veterinary workers on the Continent. In other ways, however, the main trends I have outlined are of general application. From a mycological point of view the development of medical mycology is in sharp contrast to that of plant pathology. Professional mycologists have always moved freely in and out of the field of plant pathology where advances in general mycology have frequently originated, and one result of this has been that until recent years the description and identification of fungi has been an important preoccupation of many plant pathologists. Very few mycologists have ventured into the medical field and if plant pathology has at times suffered from too much mycology, the study of mycotic diseases in man and animals has suffered from too little. In this age of specialization a medical man can rarely master the intricacies of mycology, while a thorough mycological apprenticeship normally precludes a medical training. The fruitful and even spectacular achievements which result from the collaboration of trained mycologists with medical men are clear from the progress made in North America during the past two decades. If similar progress is to be made elsewhere, this practice must spread.

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SOME NEW SPECIES OF MOULDS AND SOME NEW BRITISH RECORDS

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(With Plates 1 and 2)

The following are described for the first time: *Aspergillus thomii* n.sp., a laboratory contaminant; *Penicillium cyclopium* var. *album* n.var., from a banana fruit; *Nodulisporium africanum* n.sp., from cellulose acetate film in West Africa (reference is also made to *N. thelenum* (Sacc.) n.comb.); and *Circinella rigida* n.sp., from soil. The following are recorded as new to Britain: *Penicillium spiculosporum* Lehman on vegetable-tanned hide; *P. helicum* Raper & Fennell from soil; and *Petriella asymmetrica* Curzi from chemically treated soil in Northern Ireland.

The present communication describes a number of species of moulds which have been isolated in the Department of Biochemistry, London School of Hygiene and Tropical Medicine, or have been sent for identification from other laboratories.

***Aspergillus thomii* sp.nov.**

Coloniis in agar Czapekii late crescentibus, planis, primo ochraceis dein brunneoribus sed inquam vere brunneis, reverso brunneo-flavo; capitulis conidioferis breve columnaribus cultis maturis; stipitibus asperis, luteolis, 300-750 μ long. et 7-10.5 μ diam.; vesiculis subglobosis aut pyriformibus, 20-30 μ diam.; metulis, in capitulis magnis, 6-10 μ long., in capitulis parvis absentibus; phialidibus 6-7 μ long.; conidiis subglobosis, leviter asperulis, 4-4.2 μ , plerumque 4 μ diam.

Fungus contaminatione in laboratorio London School of Hygiene and Tropical Medicine inventus.

In November 1946 a culture of *Oidiodendron fuscum*, on liquid culture medium, was found to be contaminated with a species of *Aspergillus*. Examination of pure cultures showed that it differs substantially from all known species of the genus. At first, owing to its colony colour and the roughness of the stalks, it was thought to be allied to *A. ochraceus*. A culture was sent to Dr K. B. Raper, who suggested that it is more nearly allied to *A. wentii* than to *A. ochraceus*. However, further examination has shown that its real affinity is with the *A. flavus-tamarii* group.

Colonies on wort agar or potato-dextrose agar spread rapidly, at first deep ochraceous, becoming somewhat browner but never true brown. The final colour is between Ochraceous Tawny and Buckthorn Brown (Ridgway) with reverse brownish yellow. On Czapek agar growth is somewhat slower and the colour slightly paler at first, but eventually the same shade is reached.

Stalks arising from submerged hyphae, rough, with walls pale bright yellow, 300-750 μ by 7-10.5 μ ; heads at first more or less radiate but becoming definitely columnar; vesicles globose to pyriform, 20-30 μ in diameter, bearing phialides alone in small heads, metulae and phialides in

large heads;* metulae 6–10 μ long; phialides 6–7 μ long; conidia subglobose, delicately roughened, 3·4–4·2 μ , but mostly 4 μ in diameter.

On Czapek's solution kojic acid, a substance produced by very few species of moulds other than those of the *A. flavus-oryzae-tamaris* series, is formed in good yield.

***Penicillium cyclopium* Westling var. *album* n.var.**

A *P. cyclopio* differt propter defectionem totam pigmenti viridis. In fructo *Musae* inventus.

In May 1947 Mrs S. Marcus, of this Department, isolated from a mouldy banana a species of *Penicillium* of a pure white colour. Cultures have exactly the characters of *P. cyclopium* West. except for the total lack of conidial pigment. Colonies granular velvety, indistinctly zoned, persistently white even in age with reverse pale yellowish brown and strong mouldy odour; penicilli typical, asymmetric with normally three stages of branching; conidiophores rough, 3–5 μ in diameter; phialides 10–11 $\times$ 2·5 μ ; conidia globose to subglobose, smooth, 3·1–3·8 μ diameter.

***Nodulisporium africanum* sp.nov.**

Coloniis celeriter crescentibus, cum stromate brunneo-atro et hyphis aetheriis brunneolis hyphis septatis, fuscis, circiter 4 μ diam., cum granis nigris dense ornatis; conidiophoris erectis, septatis, pede brunneolo et apice paene hyalino, saepe cum granis nigris ornatis. circ. 3 μ diam., sursum bi-tri-ramosis, incomposite verticillatis, parte ramosa 40–60 μ long. conidiis in apicibus denticulatis ramulorum extremorum singulis factis, denique 2–5 aggregatis, ovoideis vel oblongis, basi contracto, hyalino-fusculis, 6–7·5 $\times$ 3–3·5 μ .

Fungus in 'cellulose acetate', Africa occidentale inventus.

I received from the West African Testing Establishment of the Ministry of Supply, in June 1946, a sample of cellulose acetate film which had been exposed in the jungle to test its durability, and was completely covered with a dark coloured fungus. Examination of the specimen showed a network of dematiaceous hyphae and a fair number of ovate, slightly brownish conidia, but, owing to the handling to which the sample had been submitted, no recognizable sporing structures were visible. However, no difficulty was experienced in obtaining pure cultures, since the fungus grew rapidly on any of the usual laboratory culture media.

Colonies spread rapidly, forming an almost black stromatic layer on the surface of the medium, with loosely floccose aerial growth of a pale brownish colour. Vegetative hyphae are about 4 μ in diameter, septate, dark brown, and usually thickly studded with very dark granules. Conidiophores are erect, septate, pale brown to almost hyaline at the apex, but often, like the vegetative hyphae, studded with dark granules. Branching is in several stages, irregularly verticillate. The whole structure, from the lowest point of branching to the tip is normally 40–60 μ , and the diameter of the main stalk about 3 μ . The ultimate branches are at first rounded at the tip; then an apiculus develops and produces a single conidium; the tip of the branch swells somewhat and produces successively further apiculi to a total of 4 or 5, each bearing one conidium. Frequently a septum appears, cutting off the spore-bearing tip of the branch. The conidia are pale brown

* The terms 'metulae' and 'phialides' are preferred to 'primary sterigmata' and 'secondary sterigmata' as used by Thom and Raper in their *Manual of the Aspergilli*, 1945.

almost hyaline, long oval to oblong, constricted at the point of attachment, $6-7.5\mu$ by 3.35μ .

The findings agree fairly well with the description of *Stachylidium thelenum* Sacc. (*Sylloge* IV, 331). Pl. 1, fig. 1, Pl. 2, figs. 5, 6, show typical conidiophores of the West African fungus, and Pl. 1, fig. 2, Saccardo's illustration of *S. thelenum* (*Fung. Ital.* fig. 51). However, there is no doubt at Saccardo was in error when he included his species in *Stachylidium*. His own diagnosis of the type species of the genus, *S. bicolor* Link, gives 'conidiis...in capitula muco conglutinatis', whereas for *S. thelenum* his description gives 'conidiis in apice denticulato ramulorum 2-5 aggregatis'. A comparison of Saccardo's illustration of *S. bicolor* (Pl. 1, fig. 3), of which he states that he possesses a specimen, with that of *S. thelenum* shows clearly that the two species have quite different methods of spore production. In *S. bicolor* the ultimate branches of the conidiophores are true phialides, and the conidia are slimy phialospores, whereas in *S. thelenum* the ultimate branches of the conidiophores are not phialides but produce dry radula spores.

Saccardo states that *S. thelenum* is the conidial state of *Rosellinia thelenae* (Fr.) Rabh. The latter has been collected a number of times in Britain (Misby & Mason, 1940, p. 155) and, through the kindness of Mr E. W. Mason, I have been able to examine slides of the conidial stage, which presumably can be regarded as *S. thelenum* Sacc. It is similar to, but not identical with, the West African fungus.

The new species appears to fit best in the genus *Nodulisporium* Preuss. This genus was erected on two species, *N. album* and *N. ochraceum*, both of which are pale coloured. The West African fungus is sufficiently dark coloured to be termed dematiaceous, but the method of spore production is very similar to that described and figured for *N. album* (Pl. 1, fig. 4).

Although the fungus, when first isolated, grew readily on laboratory media, cultures proved to be short-lived and eventually the species was lost. A number of dried cultures have, however, been retained and one of these has been deposited at the Commonwealth Mycological Institute, Kew. There remains the question of *Stachylidium thelenum* Sacc., which is obviously in the wrong genus. I propose for this fungus ***Nodulisporium thelenum*** (Sacc.) n.comb., status imperfectus *Rosellinia thelenae* (Fr.) Rabh.

***Circinella rigida* sp.nov.**

Colonii celeriter crescentibus, floccosis, 2-5 mm. alt., griseis, nunquam brunneolis; sporangiophoris longis, procumbentibus, tortuosis, sympodialiter ramosis, 4-6 μ diam., apice terminale omnis rami crassiore, 10-14 μ diam., circinato, cum uno septo; sporangiis ovatis, spinulosis aut verruculosis, ad 70 μ diam.; tunicis sporangiorum rigidissimis; columellis segmentatis in sectione, cum apophysibus, ad 30 μ crass. et 15 μ alt.; sporidiis hyalinis, prope globosis, 4.5-5.2 μ diam.

Habitat in solo, Lakenheath Warren, Suffolk, Anglia.

Amongst a batch of cultures sent to me by Mr J. H. Warcup, of the Botany School, Cambridge, was an unidentified species of *Circinella*. A search of the relevant literature failed to place it with any known species of the genus and it is, therefore, believed to represent a new species. It was isolated from the soil of Lakenheath Warren, Suffolk.

Colonies grow well on wort agar or potato-dextrose agar, less rapidly on

Czapek agar or carrot extract agar, matted floccose 2–5 mm. high, dark grey without any suggestion of brownish tones. Sporangiophores are very long, mostly procumbent, at intervals forming helical coils, sympodially branched, $4\text{--}6\mu$ diameter. The terminal portion of each branch, that is the portion beyond the point of issue of the next branch, is considerably enlarged, usually to $10\text{--}14\mu$ diameter. It is coiled in typical fashion and bears a terminal sporangium, and always has one septum a little below the sporangium. Frequently the sporangium is surrounded by one or more complete turns of the sporangiophore (Pl. 2, fig. 7). Sporangia are globose minutely spinulose or verrucose, black in mass, very dark brown by transmitted light, varying much in diameter with a maximum of about 70μ . The sporangial wall is very firm, being difficult to squash in fluid mount without breaking the cover-glass. The columella is distinctive, being segmental in section, up to 30μ wide and about half as high, with distinct apophysis at the base, as is found in species of *Rhizopus* and *Absidia* (Pl. 2, fig. 8). Spores are brown, roughly globose, $4\cdot5\text{--}5\cdot2\mu$ diameter. This species is distinguished from all other species of the genus by the character of the sporangial wall, the shape of the columella and the apophysis. The specific epithet refers to the very persistent sporangial wall.

***Penicillium spiculisporum* Lehman**

A typical strain of this species, previously unrecorded for this country, was sent for identification from the British Leather Manufacturers' Research Association. It had been found growing, as a mass of white perithecia, on a sample of vegetable-tanned hide.

On Czapek agar or wort agar the mould grows rapidly, forming at first a pure white mat of fine hyphae. Mature cultures show considerable variation. In all cases perithecia are quickly produced, at first white, sometimes remaining so, but at other times turning cream coloured or faint pink. Some cultures turn yellow and the pigment appears to be stable in light, whereas Thom (1930) states that yellow pigment is formed only in darkness and fades on exposure to light. In most cultures conidial production is sparse, but sometimes old cultures develop irregular patches of dirty green, whilst occasionally the whole colony becomes smoky green due to a luxuriant growth of conidiophores above the perithecial layer. So far it has not been possible to define conditions which favour the production of pigments or conidiophores.

Penicilli are frequently monoverticillate, but occasionally typically biverticillate heads are found. The phialides are long and slender, of the shape typical of the group Biverticillata-Symmetrica, $10\text{--}11 \times 1\cdot2\mu$, and the conidia ovate to pyriform, smooth, $2\cdot5\text{--}4(5) \times 2\text{--}3\mu$. Perithecia are subglobose, up to about 2 mm. diameter, white, cream, pinkish or yellow, easily crushed; asci subglobose, 8-spored; spores ellipsoidal, without any trace of furrow or frills, finely spinulose all over, $3\text{--}4 \times 2\text{--}2\cdot6\mu$.

***Penicillium helicum* Raper & Fennell.**

A culture of this interesting species was sent for identification by Mr J. H. Warcup, Cambridge. It was isolated from a pine root near the chalky boulder clay at Wangford Warren, Suffolk.

It is readily distinguished from other species of the *P. luteum* series by the perithecial initials, which are at first in the form of a loose helix, and by the small size of the ascospores, which measure $2.5-3 \times 1.5-1.8 \mu$ and are finely spinulose. Raper and Fennell (1948) state that the type grows only slowly on Czapek agar. This isolate, however, grows well on Czapek agar containing trace elements, or on wort agar, with colonies bright yellow at first, becoming orange yellow, and reverse orange to orange brown. Conidia are sparse and either monoverticillate or more or less typically verticillate. Perithecia are produced abundantly and are like those of other members of the series, yellow, globose, loose-textured, and embedded in a mat of pigmented hyphae.

Petriella asymmetrica Curzi.

An unidentified mould was sent to me in 1946 by Dr G. E. Turfitt, who had isolated it in Garvagh, Northern Ireland, from soil which had been experimentally mixed with 3-hydroxy- Δ^4 -cholenic acid. The culture soon began to develop typical synnemata of a *Graphium* or *Sporocybe* species, and later produced numerous perithecia. I am indebted to Mr E. W. Mason, to whom I sent a culture, for identifying it as *Petriella asymmetrica*, with conidial stage *Sporocybe curziana* Mason.

Originally colonies on potato-dextrose agar or corn-meal agar grew slowly at first, forming a thin gelatinous mycelium, then quickly developed the *Sporocybe* stage, and produced perithecia only after several weeks. On Czapek agar or wort agar synnemata were produced but no perithecia. With continued cultivation the imperfect stage has gradually been suppressed, although aerial ropes of hyphae are formed, suggesting abortive attempts to produce synnemata. Perithecia are still regularly formed.

The synnemata are simple or compound (i.e. consisting of erect fascicles with numerous lateral synnemata); conidiophores dark coloured but most hyaline at the tip, bearing small clusters of phialides; conidia ovate to elongate, usually tapering somewhat at one end, almost hyaline, $10.5 \times 3-4.5 \mu$; perithecia solitary or more or less gregarious, brown, thick-walled but crushing easily, with very short neck but prominent ostiole; spores biconvex, brown, with prominent oil drop, $8-11$ (mostly $9-11$) $\times 4.2-5 \mu$.

I am greatly indebted to Dr S. P. Wiltshire for photographic copies of the illustrations from Saccardo's *Fungi Italici*, and to Mr E. W. Mason and Mr S. J. Hughes for advice on questions of nomenclature. Cultures of *Aspergillus thomii*, *Penicillium cyclopium* var. *album* and *Circinella rigida* are maintained in the L.S.H.T.M. collection, and will be deposited at the Centraalbureau voor Schimmelcultures, Baarn, and at the Commonwealth Mycological Institute, Kew.

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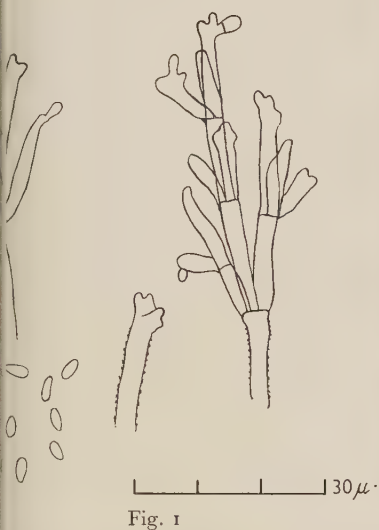
EXPLANATION OF PLATES

PLATE I

- Fig. 1. *Nodulisporium africanum* n.sp. Details of conidiophores and spores.
Fig. 2. Saccardo's illustration of *Stachylidium thelenum*. (*Fung. Ital.* fig. 51.)
Fig. 3. Saccardo's illustration of *Stachylidium bicolor*. (*Fung. Ital.* fig. 50.)
Fig. 4. *Nodulisporium album* Preuss. Original figure, copied from Costantin '*Les Mucédinées Simples*'.

PLATE 2

- Fig. 5. *Nodulisporium africanum* n.sp. Photograph of conidiophore in living culture. $\times 200$.
Fig. 6. *N. africanum* n.sp. Ultimate branches of conidiophores. $\times 1000$.
Fig. 7. *Circinella rigida* n.sp. Sporangium surrounded by the coiled sporangiophore. $\times 250$.
Fig. 8. *C. rigida* n.sp. Sporangium, showing shape of columella and apophysis. $\times 500$.



Saccardo, *Fungi italici* - *Hypomycetæ*.

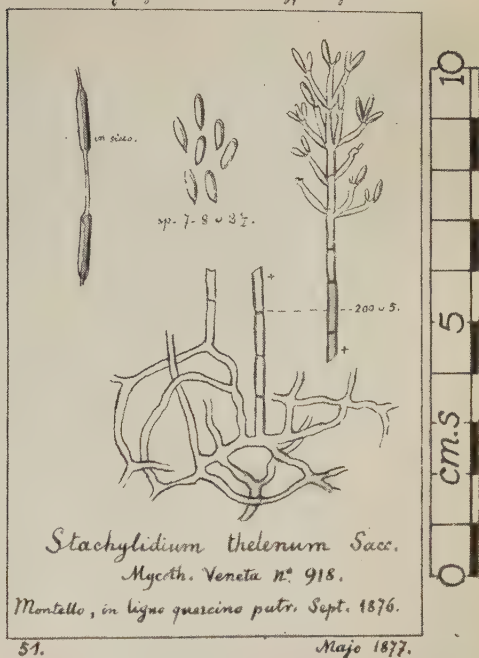


Fig. 2

Saccardo, *Fungi italici* - *Hypomycetæ*.

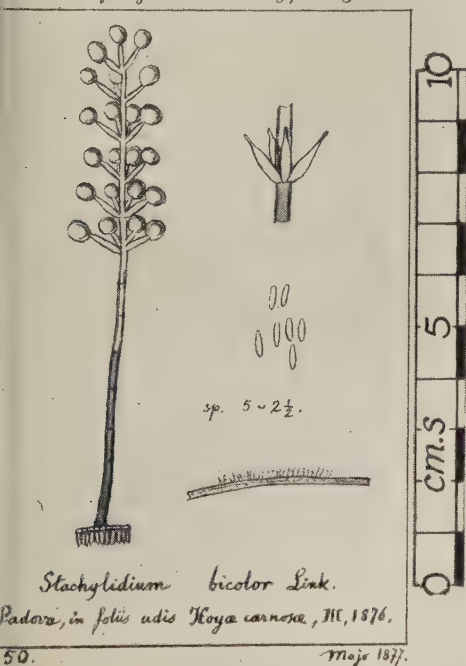


Fig. 3

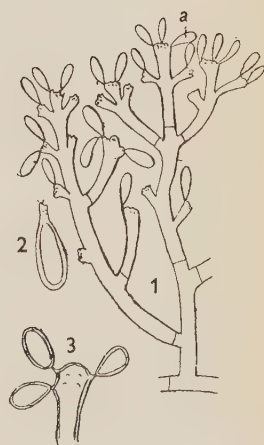


Fig. 4



Fig. 5



Fig. 7

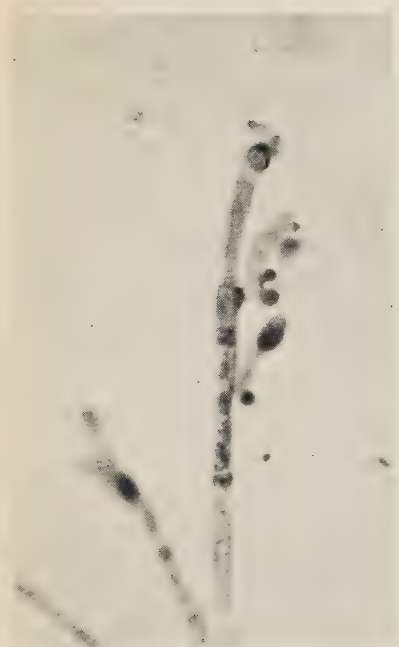


Fig. 6

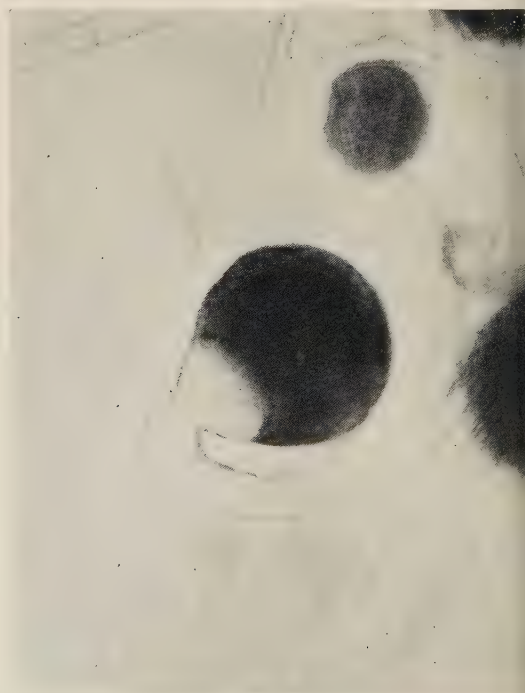


Fig. 8

CORYNEBACTERIUM FASCIANS (TILFORD) DOWSON; ITS MORPHOLOGY, PHYSIOLOGY, NUTRITION AND TAXONOMIC POSITION

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The morphology, physiology and nutrition of twenty-two strains of *Corynebacterium fascians* (Tilford) Dowson, including an unpigmented variant, have been investigated in detail with the object of determining whether this organism is correctly placed in the genus *Corynebacterium*. It is concluded that of the seven genera in which it might be placed on account of its nature as a Gram-positive non-acid-fast rod-shaped bacterium, the genus *Corynebacterium* is the one best fitted to receive it. This is largely because of the lack of rigidity in the specification of this genus.

It was confirmed that thiamine is an essential growth factor, and it was shown that biotin is stimulatory, though not essential.

The isolation of the organism causing the so-called 'fasciation', 'leafy-stalk' or 'cauliflower' disease, which affects a wide variety of plants, was reported in 1936, almost simultaneously by Tilford and by Lacey. Tilford (1936) named it *Phytomonas fascians* n.sp., while later Lacey (1939) called it *Bacterium fascians*. On the basis of the descriptions furnished by these two workers, Dowson (1942) placed the organism in the genus *Corynebacterium*, together with the other known Gram-positive plant pathogens, and it appears under this designation in the latest (VIth) edition of Bergey's *Manual of Determinative Bacteriology* (1948). Conn (1947) deprecated this action, arguing that so many bacteria of diverse origin have been placed in the genus *Corynebacterium* that there now seems no reason why all Gram-positive non-spore-forming rods except lactobacilli should not be included in it. Conn and Dimmick (1947) also expressed doubts whether the fasciation organism should be placed in the genus *Corynebacterium*, but they supplied no further information about the characters of the species. It is desirable that these doubts should be resolved, and as there are certain discrepancies between the descriptions given by Tilford (1936) and Lacey (1936), especially with regard to the behaviour in milk and gelatin and the action on sugars, it was considered that a fuller investigation was required of the morphological and biochemical characters of this organism, employing a number of strains and paying particular attention to features which might aid in its classification.

MATERIALS AND METHODS

Twenty-two cultures have been examined, obtained from fifteen different host plants with a variety of symptoms, as shown in Table 1. They represent eighteen separate isolations, with four variants derived from the parent cultures. Ten of these isolations were recent, being made by me between May and October 1946. The other eight were made by Dr M. S. Lacey

between 1935 and 1945. Of the four variants one (2WR) was derived from a white sector which appeared in a colony on tellurite agar of the recently isolated culture 2S, while the three others were rough variants obtained from smooth parent cultures of the earlier isolations 12S, 484S and 496S.

Pathogenicity was tested on sweet-pea seedlings (mixed hybrids). The seeds were surface sterilized by soaking for 2-3 min. in absolute alcohol followed by 0.1% mercuric chloride for 10 min., with three washings in sterile water. After germination in dishes on moist sterile filter-paper the seedlings were transferred to 3 × 1 in. plugged sterile tubes containing 12 g.

Table 1. *Origin of the strains of Corynebacterium fascians investigated*

Strain number	Culture phase	Host plant	Signs of disease	Isolated by	Date of isolation
1S	Smooth	<i>Dahlia</i>	Leafy gall	Mohanty	29. v. 46
2S	Smooth	Wallflower	Witches broom	Mohanty	3. vi. 46
2WR	Rough				
3S	Smooth	<i>Primula</i>	Leafy gall	Mohanty	10. vi. 46
P ₄ S	Smooth	<i>Phlox</i>	Dwarfing, abnormal leaf	Mohanty	25. vi. 46
S ₅ S	Smooth	Garden Pea	Cauliflower in leaf axil	Mohanty	7. viii. 46
V ₆ S	Smooth	<i>Verbascum</i>	Leafy gall	Mohanty	8. x. 46
P ₇ S	Smooth	<i>Pelargonium</i>	Leafy gall	Mohanty	8. x. 46
H ₈ S	Smooth	<i>Heuchera</i>	Dwarf basal shoots	Mohanty	21. x. 46
A ₉ S	Smooth	<i>Antirrhinum</i>	Bushy basal growth	Mohanty	21. x. 46
V ₁₀ S	Smooth	<i>Verbascum</i>	Leafy gall	Mohanty	21. x. 46
12S	Smooth	Sweet pea	Fasciation	Lacey	1935
12R	Rough				
484S	Smooth	Strawberry	Cauliflower	Lacey	26. v. 39
484R	Rough				
421S	Smooth	<i>Asparagus</i>	Nodal gall	Lacey	29. vi. 37
405R	Rough	<i>Nicotiana</i>	Leafy gall	Lacey	16. iii. 37
448S	Smooth	<i>Petunia</i>	Leafy gall	Lacey	11. ii. 48
444S	Smooth	<i>Chrysanthemum</i>	Leafy gall	Lacey	11. i. 38
496S	Smooth	Wallflower	Witches broom	Lacey	20. x. 44
496R	Rough				
497S	Smooth	<i>Primula</i>	Leafy gall	Lacey	13. iv. 45

of moist sand and inoculated without wounding with 0.1 ml. of a visibly turbid suspension of the culture in sterile water. Fifteen seedlings were used for each test. Though observations were continued for 4 weeks, signs of infection were usually present within 3 weeks, in the form of the production of multiple basal shoots. All except three of the freshly isolated strains (S₅S, H₈S and A₉S) and four of the older ones (12S, 12R, 421S and 405R) proved to be pathogenic to sweet pea, but 100% infection was never obtained in any one trial, the proportion lying between one- and two-thirds.

It is noteworthy that the white variant was pathogenic, being one of the more active strains. The four older non-pathogenic cultures were all infective when tested directly after isolation by Dr Lacey, and were still highly virulent when tested 5-6 years later, and the failure of the three fresh cultures to stimulate shoot production is at present obscure. In spite of their lack of pathogenicity these three cultures are regarded, on cultural and physiological grounds, as undoubted strains of *C. fascians*. The question of plant infection will form the subject of a further paper.

Standard bacteriological methods have been employed. Details of special media, etc., are given in the appropriate place. All incubations

were carried out at 25° C. except where stated, and the Kopeloff and Beerman modification of the Gram stain was used throughout.

RESULTS

Macroscopic characters

Filford (1936) has already reported the occurrence of rough and smooth colony forms, both of which have been encountered in the present work. All ten of my isolations yielded smooth colonies, as did those of Lacey. These were round, entire, convex, opaque and chrome-yellow to cream in colour on nutrient agar. The consistency was moist, the growth flowing over the loop pulled through the colony. On nutrient agar containing 1% of fermentable sugar the consistency tended to be mucoid, and this was especially noticeable on potato-dextrose agar. The pigmentation was very much deeper on the agar media containing carbohydrate, and growth was heavier.

In old cultures, on both solid and liquid media, there was a tendency for rough variation to occur, though the reverse mutation was not observed. The variation seemed to be stimulated by the presence of certain salts, e.g. ammonium molybdate (0.25% or more) and sodium selenite (0.002%). Rough colonies on nutrient agar were larger than the smooth ones, irregular in outline, opaque, dry and wrinkled in appearance and of a brittle consistency, the growth adhering in masses to the loop. The colour was chrome-yellow to cream. In the presence of fermentable carbohydrates the rough colonies became slightly gummy, and the pigment deepened.

Cultures on nutrient agar containing 1% of mannitol and kept at room temperature for several weeks frequently, though not consistently, developed a brownish pink, sometimes almost black discoloration of the agar, the growth itself remaining deep yellow.

On one occasion a colony of the smooth strain 2S on nutrient agar containing 0.002% of potassium tellurite formed a white sector. Isolations were made from this, and the white variant obtained proved exceedingly stable. It was in the rough phase, but otherwise possessed all the characteristics of the parent culture, including pathogenicity.

In liquid media young cultures of smooth strains (48 hr. old) exhibit uniform turbidity without a pellicle, whereas rough strains form a coarsely granular growth with sediment and pellicle, the upper layers of the liquid usually being clear. On further incubation, cultures of smooth strains often form pellicles, indicating the occurrence of rough variation.

Microscopic characters

Motility. Motility was never observed in cultures in liquid media.

Morphology and staining characters. Cultures three days old of all twenty-two strains on nutrient agar consisted of Gram-positive rods. Except with strains 1S, P₄S, 484R and 405R, where the predominant arrangement of the cells was side by side in palisades, the pattern exhibited was a characteristic angular one resulting in V-formations. Chains of cells were not seen, nor was branching evident. The Gram stain revealed granules in

nine strains (S₅S, V₆S, P₇S, A₉S, 12R, 484R, 444S, 496R and 496S), the remainder appearing uniformly stained.

On 1% mannitol agar the picture was somewhat different. Cultures three days old of all strains except 484S and 448S showed elongated forms with some chains of cells, these being especially prominent in strains 3S, P₇S, V₁₀S, 12R and 444S. All strains showed a proportion of both V- and palisade arrangements, the latter being especially noticeable in 405R and 448S. On this medium granular staining appeared only in strains 444S and 496S.

Morton (1940) noted that in *C. diphtheriae* rough colonies tended to contain chains of cells, smooth colonies showing organisms in the palisade, V- and Y-arrangements. In *C. fascians* palisade and V-formations occurred on both nutrient and mannitol agar, in rough and smooth strains alike. Chains were formed very rarely on nutrient agar, and then only in old cultures, but of both rough and smooth strains. Association of chain formation with culture phase may have been masked by the occurrence of rough variation in the old smooth cultures, but as on mannitol agar chains were seen in young cultures of both rough and smooth strains, the association of chains is with medium rather than with colony type.

According to Morton (1940) *C. diphtheriae* forms coccoid cells when grown in media containing magnesium-, copper- or sodium-sulphate. The effect of these compounds on strains 2S, V₆S, 421S and 405R was studied, using concentrations of 0.01 and 0.02% in nutrient broth. Gram-stained preparations were made weekly for 4 weeks. In these media the cells invariably became granular, with the contents localized either at the centre or at both poles of the cell, the remainder being unstained. At first sight the appearance was of single and paired cocci, but the cell outline was quite distinct and there was no actual change in cell size or morphology. Morton (1940) also obtained coccoid forms of *C. diphtheriae* in broth containing 5% of glycerol and 1% of glucose, but this medium also did not cause *C. fascians* to form cocci.

Cell size. *C. fascians* grows slowly, and very young cultures are not ordinarily examined. It was considered desirable to do this, not only to complete the morphological picture but because Clark and Ruehl (1919) claimed that the cells of the diphtheria bacillus in cultures 2-6 hr. old were smaller than those in the inoculum from an older culture, though with other bacteria the reverse is the case. Albert (1921) could not repeat this, and showed that *C. diphtheriae* behaved like other bacteria.

Strains 2S and 405R were selected for intensive examination. Following the method of Clark and Ruehl (1919) the lag phase was eliminated by making three successive transfers on nutrient agar slants at 2-day intervals. The growth on the final culture was emulsified in 2 ml. of broth, and 0.1 ml. of this was used to inoculate the slant cultures to be examined, from which Gram-stained films were made every 2 hr. up to 12 hr., then every 4 hr. up to 24 hr. Subsequently, films were made 6-hourly up to 48 hr., then after 3 days, 1 week, 2 weeks and 4 weeks. Cell sizes were measured, and the shape and evenness of staining observed.

Measurements based on the mean values from twenty cells taken at random revealed that the length increased from approximately 4 μ at the

start to 18–20 μ at 20–24 hr., with a very short lag of about 4 hr. before any increase was evident. After 24 hr. the length steadily decreased, reaching the initial value of about 4 μ in 48 hr.

The cells of the inoculum were regular-shaped rods. After 4 hr. the cells became swollen at one end and appeared club-shaped. Later, the proportion of these cells decreased till at 8 hr. hardly any were visible. The regular-shaped rods then remained the predominant form. In the 4-week-old cultures a few chains of cells were seen.

Uniform staining was the rule up to 6 hr., when granules appeared in a proportion of cells. This proportion increased until at 24 hr. almost all the cells were granular. Subsequently there was a reappearance of uniformly stained cells, the transition being practically complete in 36 hr., though even after 2 and 4 weeks a small proportion of granular cells remained.

Physiological characters and metabolic activities

Carbohydrate fermentation in peptone water

In no instance was even slight acid formation observed by any of the strains from dextrose, lactose, maltose or soluble starch in 1% peptone water with brom-thymol-blue as the indicator, though the cultures were incubated for 4 weeks. Three strains, 12R, 484R and 405R, formed a little acid from sucrose, and most of the strains formed acid from mannitol. The zone of colour change of the indicator never extended more than 1 cm. from the surface of the culture, and when the tube was shaken the acid surface layer became neutralized by the remainder of the culture. The final reaction of all cultures in all the media was alkaline. These results confirm those of Lacey (1936) except for the acid production in mannitol, but both Lacey (1936) and Tilford (1936) reported acid production in a synthetic medium. Both found that growth of *C. fascians* in synthetic media was unsatisfactory, a fact which suggested the existence of a growth-factor requirement, though Starr and Weiss (1943) were able to grow two strains successfully in a medium containing asparagine as the sole source of carbon and nitrogen. Accordingly, before proceeding further it seemed desirable to investigate this point.

Growth-factor requirements

When inoculated into the Starr and Weiss medium, growth of the twenty-two strains proved very uncertain. Most strains failed to develop in a week and those that did grew very poorly. However, when supplemented with thiamine at 10 $\mu\text{g.}/\text{ml.}$ the medium supported good and reasonably rapid growth from a small inoculum of all strains except 12S and 497S. Growth appeared in 2 days and reached its maximum in 6 days. Culture 497S failed to grow at all in 6 days, but 12S developed slowly, growth being visible, though slight, in 4 days and still poor in 6 days. At this time (1947), in a personal communication, Starr announced that he had also demonstrated that *C. fascians* needs an exogenous source of thiamine. This finding has now been published (Starr, 1949).

It was frequently observed, in a number of media, that the strain 12S grew slowly, while strain 497S would grow more slowly still, often producing

no more than a trace of growth in 10 days, though in 20–25 days it would become quite abundant. It was considered that this slow development might have been the consequence of difficulty in utilizing asparagine, so strain 497S was inoculated into the asparagine-thiamine medium supplemented with mannitol, which is known to lead to heavier growth. Still there was no growth in 6 days. However, the further addition of 0.1% of Difco yeast extract provided a medium in which growth of strain 497S began in 3–4 days, which suggested that another growth factor of the B complex would prove stimulatory. Accordingly, the mannitol-asparagine-thiamine medium was supplemented with the following, used singly: β -alanine, nicotinamide, pimelic acid, oleic acid, uracil, and the sodium salt of yeast nucleic acid, all at 1 μ g./ml., and biotin, at 0.1 μ g./ml. In these media all twenty-two strains were tested, and of the various substances biotin alone produced a response. That of strain 497S was marked, growth commencing on the fourth day and becoming fairly heavy in 7 days, when it was at least equal in amount to that formed in 20–25 days in the absence of added biotin. The remaining twenty-one strains all showed stimulation by biotin, growth in the first few days being somewhat heavier, but after 8 days, or sometimes less, the difference was no longer apparent. It may therefore be concluded that while thiamine is an essential growth factor, biotin is merely stimulatory.

Carbohydrate fermentation in synthetic media

The growth-factor requirements having been determined, the way was now clear for the study of carbohydrate fermentation in the absence of alkali-yielding substances such as peptone. The basal medium employed contained: ammonium dihydrogen phosphate 1.0 g., potassium chloride 0.2 g., magnesium sulphate (cryst.) 0.2 g., distilled water 1 l. The reaction was adjusted to pH 7.0, brom thymol blue (aqueous solution of the sodium salt) added as indicator, and a supplement of thiamine (1.0 μ g./ml.) provided. The various carbohydrates were added in 1% concentration. All cultures were incubated till acid was seen, or for 2 weeks, longer being allowed for the slow growing strain 497S. All the tests were repeated three times, and with maltose a further two trials were made with a second sample of the sugar.

The results were quite consistent. Acid was formed by all strains from dextrose, sucrose and mannitol, with satisfactory growth. Lactose supported growth of all strains but only half of them formed acid, viz. strains 1S, S₅S, V₆S, P₇S, H₈S, A₉S, V₁₀S, 484S, 484R, 444S and 497S. This agrees with the findings of Lacey (1939), and it was observed that growth with lactose was definitely heavier where acid was formed.

Growth was made by all strains with maltose, but it was poor, and only 3S, H₈S, 484R, 444S and 497S produced a trace of acid. These results differ from those of Tilford (1936) and Lacey (1936, 1939), both of whom found that maltose was slightly attacked. Actually two of the strains found maltose-positive by Lacey (1939), namely 12R and 12S, were negative in the present trials. Possibly the earlier work had been done with less pure samples of maltose.

Soluble starch did not support the growth of any of the strains.

Voges-Proskauer reaction

In view of the consistent attack on dextrose this test was carried out on cultures in the standard glucose-phosphate-peptone medium, but the results were negative with all strains.

The utilization of single substances as sources of carbon, or nitrogen, or of both elements

The basal medium comprised: potassium dihydrogen phosphate 0.5 g., dipotassium phosphate 0.5 g., magnesium sulphate (cryst.) 0.2 g., sodium chloride 0.1 g., ferric chloride 0.001 g., thiamine 1.0 µg./ml. To this the compound under investigation was added, in appropriate concentration. With compounds lacking nitrogen, 2.0 g. ammonium chloride was also added. Where nitrogen only was supplied in the compound, mannitol (1%) was added in addition. Mannitol was also provided in certain cases with compounds containing both carbon and nitrogen. The standard medium for comparison contained asparagine (0.2%) and mannitol (1%). All media were brought to pH 7.0. Strain 497S was not examined in these experiments, and extended incubation was provided for strain 12S.

(i) *Organic acids as sources of carbon*. The following were tested, all at 0.5% concentration: acetate, propionate, butyrate, lactate, fumarate, maleate, oxalate, succinate, tartrate, glutarate and citrate. All the twenty-one strains tested behaved alike with any one compound. Of the fatty acids tested there was questionable growth with acetate, while propionate and butyrate were not utilized. Lactate was an excellent source of carbon. Of the saturated dicarboxylic acids succinate was readily used, but glutarate, the next higher homologue, supported barely a trace of growth. Oxalate was utilized, with good though very slow growth, which however occurred consistently in serial subcultures in the same medium. There was no acceleration of growth in successive cultures. The two isomeric unsaturated dicarboxylic acids maleate and fumarate behaved very differently, the former (*cis*) being readily available while the latter (*trans*) was only slightly so. The tricarboxylic acid, citric, was moderately well used.

(ii) *Nitrogen sources*. In the basal medium with 1% of mannitol there was good growth in 4 days with asparagine, succinimide, urea and uracil, while with nitrate and ammonia it was somewhat less good. Neither nitrite nor indole could support growth, and the result was doubtful with creatine, 7 days' incubation being given in all three cases. No strain variation was observed.

(iii) *Single amino-acids as sources of carbon and nitrogen*. Observations in these experiments were first made after 4 days' incubation and then at intervals up to 10 days where growth was poor or doubtful. The substances were in 0.05% concentration. L(+)-glutamic acid, L(-)-aspartic acid, L(-)-proline and L(-)-tryptophane all supported moderate to good growth of the twenty-one strains. DL-valine, DL-alanine, L(-)-leucine, cysteine, glycine and histidine did not function as sources of both carbon and nitrogen, but when retested in the presence of mannitol all except histidine gave moderate to good growth and were thus able to serve as sources of nitrogen.

(iv) *Comparative growth on different nitrogen sources.* Hagg, quoted by Jensen (1934), held that corynebacteria in general required rich media containing peptone, but the latter was unable to confirm this and in fact obtained good growth in synthetic media with ammonia or nitrate as sources of nitrogen. This point was examined, ammonium chloride, potassium nitrate, asparagine and peptone being compared in the basal medium of Jensen (1934) supplemented with thiamine. 0.2% concentrations were used, and the cultures observed every 2 days. Peptone gave the heaviest growth, followed by asparagine. Ammonia and nitrate were less available, but growth started more quickly with the former. No strain differences were noted. It is possible that the heavier growth with peptone may have been due to traces of biotin.

Gelatin liquefaction

Tilford (1936) reported that *C. fascians* did not liquefy gelatin in 7 weeks at 20° C. Lacey (1936) was of the same opinion, but later (1939) observed that at 24° C. surface liquefaction of stab cultures began in 2-4 weeks, the medium becoming of a treacle-like consistency.

Difco nutrient gelatin was employed in the present study, with incubation of stab cultures at 20° C. for 20 weeks in all. Liquefaction occurred with all strains except three (2S, 2WR and 3S). Growth took place on the culture surface only, liquefaction beginning there, its onset varying greatly with the strain from 4 to 15 weeks. The liquefied medium was at first treacle-like but finally it became quite fluid, the process being complete as a rule in about 2 weeks. Strain 448S produced a brownish pink coloration in the liquefied medium.

Action on litmus milk

Reconstituted fat-free household milk was used and the cultures held up to 20 weeks. At the start all cultures formed alkali, the change in reaction spreading downwards from the top and being complete in 3-7 days. Reduction of the litmus indicator later occurred with all strains, and was usually complete, but the time of commencement varied greatly from 3 days to 7 weeks. Reoxidation eventually took place. Coagulation was present in all cases and was complete in 2-4 weeks, though for strain 2WR 1 week sufficed. Peptonization was subsequently effected by all strains except five (1S, P₇S, H₈S, 405R and 497S), but the time of onset was very variable, lying between 2 and 20 weeks. The more active strains, 2WR, V₆S, A₉S, V₁₀S and 484R, completed the reaction in 5-9 weeks. In partly or wholly peptonized cultures the clear fluid was usually blue, though with strains A₉S, V₁₀S, 444S and 496S it was pink. Also, four of the five cultures which did not peptonize finally showed acid reactions, 497S being the exception.

Fat hydrolysis

Starr and Burkholder (1942), using the spirit blue agar method, tested four strains of *C. fascians* and demonstrated only a weak, questionable lipolytic action. In the present work all the twenty-two strains were tested by the method of Richards (1946), in which the organisms are grown on

nutrient agar containing emulsified triolein, the globules of which are coloured red with the fat-soluble, water-insoluble free base of Victoria Blue. Dipolytic organisms cause the water soluble blue dye-salt to form, with the production of blue halos around the colonies. After 7 days, all strains caused a blue stain to form immediately below the colonies, but there were no blue halos and the blue patches subsequently slowly disappeared. The dipolytic activities of *C. fascians* are apparently only slight. Possibly alkali was produced after a time in sufficient amount to neutralize the acid formed from the fat, while the originally formed blue dye-salt may have disappeared through diffusion.

Catalase production

There was vigorous effervescence when hydrogen peroxide was added to slant cultures, 7 days old, of all strains, indicating the abundant formation of catalase.

Behaviour in the presence of molybdenum, selenium and tellurium salts

When 3-day slant cultures of all strains were flooded with 1% aqueous potassium tellurite the growths became black in 4-5 hr. Using sodium selenite or selenium dioxide the colour was brick red, but molybdate solutions had no effect. Thus tellurite and selenite can be reduced, but not molybdate. Observations under dark ground illumination revealed the presence of globules within the cells, presumably of metallic selenium or tellurium. The organisms in the treated cultures were not killed, normal growth being obtained on subculture. However, when grown on nutrient agar containing tellurite or selenite at concentrations exceeding 0.002%, massive inoculation had to be employed in order to obtain even discrete colonies, and the compounds were evidently toxic. Growth was slow and the lag period prolonged in the higher concentrations, while 0.1% completely prevented growth even from large inocula. On blood-tellurite agar, however, growth was quite unaffected even by 0.05% tellurite. Colonies on tellurite agar were brown or black according to concentration. On selenite agar, the colonies were at first brick red, but later developed a ring of normal yellow growth which slowly heaped up and ultimately almost hid the red centres.

Action on cellulose

None of the strains proved able to grow and attack cellulose in Dubos's medium (Dubos, 1928), even when the medium was supplemented with thiamine.

Heat resistance

When broth cultures 1 week old were heated to 65° C. for 10 min., immediately cooled and subcultured on to nutrient agar, no growth occurred even after 2 weeks' incubation.

DISCUSSION

In the system of nomenclature used in the latest (VIth) edition of Bergey's *Manual of Determinative Bacteriology* (1948) the Gram-positive non-acid-fast rod-shaped organisms are to be found in the genera *Corynebacterium*, *Listeria*, *Erysipelothrix*, *Lactobacillus*, *Microbacterium*, *Propionibacterium* and *Butyribacterium*. Some species are also included in the genus *Bacterium*, but as this is a 'heterogeneous collection of species whose relationships to each other and to other groups are not clear', these organisms need not be considered further at this time.

In due course changes may be made in the number and the specifications of these genera of Gram-positive rods, but evidently, unless a radical alteration is made in the methods of grouping bacteria, the fasciation organism will have to be included amongst this group of seven genera. Now certain of the characteristics of this organism are common to several of these genera. The V- and palisade arrangement is shown not only by *Corynebacterium*, but also by *Listeria* and *Microbacterium*. Further, according to Shimwell (1937), *Lactobacillus pastorianus* growing in beer appears characteristically with cells lying at obtuse angles.

The aerobic character and ability to form catalase are attributes of *Corynebacterium*, *Listeria* and *Microbacterium*, though it may be noted that one species of *Corynebacterium* and *Propionibacterium* species generally, have a strong tendency towards anaerobiosis while possessing the property of forming catalase.

Using the above characters, therefore, *Erysipelothrix* and *Butyribacterium* can be excluded, while *Lactobacillus* and *Propionibacterium* are unsatisfactory as genera for inclusion of the fasciation organism. Here it may be remarked that according to Hitchner (1934) the members of the genus *Propionibacterium* are unable to utilize succinate as the sole source of carbon, whereas the fasciation organism can do so.

On the character of lack of motility, *Listeria* can be excluded, though it may be noted that some motile species have been included in *Corynebacterium*. It is questionable whether the fasciation organism is a true gelatine liquefier, in the sense of producing an exo-enzyme during active growth. The delayed liquefaction may have been due to proteolytic enzymes released when the cells autolysed. However, accepting the character as positive, *Corynebacterium* is the only one of the remaining genera which would accommodate the organism, as it contains both liquefying and non-liquefying species. Nitrate reduction has not been studied in the present work, but the ability to reduce is displayed only in synthetic nitrate agar (Lacey, 1939). This makes the character unsatisfactory in use, because although lack of ability to reduce nitrates is characteristic of all the genera except *Corynebacterium* and *Microbacterium* (apart from one species of *Propionibacterium*) the test may not have been carried out in synthetic agar media. In these two genera, ability to reduce nitrate is not a constant character of all species.

On the score of heat resistance, the genus *Microbacterium* may be judged unsuitable, for none of the fasciation cultures examined survived 65° C. for 10 min. in broth, while Lacey (1936) found the thermal death point to be

out 50° C., and Tilford (1936) gave the limits as 55–57° C. The heat resistance of *Microbacterium* species is much higher (Speck, 1943; McKenzie, Morrison & Lambert, 1946), cultures often surviving after exposure to 70° C. for 10 min. in milk.

One other character would seem to exclude all genera except *Corynebacterium*, and that is the feeble power of forming acid from carbohydrates. Acid formation is quite definite in all the other genera, but in *Corynebacterium* it may or may not be formed, and the degree of acidity produced is seldom high. Taking the evidence as a whole, therefore, the fasciation organism would seem to be properly placed in the genus *Corynebacterium*, though it is difficult to resist the conclusion that this is largely because in certain characteristics the limits set are so wide as to be all-embracing.

The matter may, however, be regarded from another point of view. Busset (1949) has recently shown that *C. diphtheriae* is in fact a multicellular organism, the individual units being almost spherical. This is interesting in view of the demonstration by Morton (1940) that one way of inducing coccoid forms in this organism was to grow it in media with added magnesium sulphate, while Webb (1949) has shown that there is an optimal concentration of magnesium ions for the occurrence of cellular separation in several species of Gram-positive rods. Presumably this optimal concentration was present in Morton's work. The fact that coccoid cells were not formed in cultures of the fasciation organism growing in 0.01 or 0.02% magnesium sulphate may indicate that it is not multicellular, or it may be that the optimal concentration was not used. The coccoidal artefacts which were observed do however suggest that a structure similar to that of the *C. diphtheriae* rod is also possessed by the fasciation organism, and hence it is desirable that the cell-wall staining technique should be applied to it. Busset and Moore (1949) have studied the 'soil diphtheroids' which branch only occasionally and have their branches separated from the parent cell, and have shown that they are really unicellular. On that ground these authors would separate them from the multicellular types. The genus *Actinomyces* has been proposed to accommodate them, and in this the fasciation organism, if found to be unicellular, might well be placed. However, *Actinomyces* is proposed as a genus of the order Actinomycetales and it is interesting to note that Conn and Dimmick (1947), on the basis of its alleged dry yellowish growth on agar, suggested a relationship between the fasciation organism and the family Actinomycetaceae of that order. It has been shown in the present work, however, that this character is not variable, but depends on the culture phase and the nature of the medium. Inclusion of the fasciation organism in the Actinomycetales will have to rest on other considerations.

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A NOTE ON THE FUNGI OF LESS COMMON OCCURRENCE IN HOUSES

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(With Plate 3)

In addition to *Merulius lacrymans* and *Coniophora cerebella*, the occurrence is noticed of *Poria vaillantii*, *Paxillus panuoides*, *Lentinus lepideus* (abortive), *Lenzites sepiaria* (normal and abortive), *Merulius pinastri*, *M. himantioides*, *Trametes serialis*, *Poria monticola*, *P. xantha*, *P. medulla-panis*, *Phellinus megaloporus*, *Fomes ferruginosus*, *Polydicticus versicolor*, *Daedalea quercina*, *Peniophora gigantea*, *Fomes roseus*, *Daldinia concentrica*, *Coprinus* spp. (*Ozonium aurantiacum*), *Asterostroma ochroleucum*, *Merulius molluscus*, *Peziza* (*vesiculosa*?), *Fuligo septica*, and *Lycoperdon giganteum*.

Merulius lacrymans (Wulf.) Fr. and *Coniophora cerebella* Pers. are between them probably responsible for over 95% of the decay that occurs in the internal woodwork of buildings in this country. While extensive and widespread outbreaks of so-called dry rot are invariably caused by *Merulius lacrymans*, *Coniophora cerebella* is responsible in the aggregate for a great amount of localized damage. The ecological requirements of these fungi differ somewhat; *Merulius* can be found in almost any part of a building, its most typical habitat is in unventilated ground floors, in panelling and joinery fixed to damp walls, while *Coniophora* attacks solid floors lying directly on damp concrete and wall plates and is often found in roofing timbers wetted periodically by leakages.

Very much less frequently found than either of the above, but of relatively common occurrence, are *Poria vaillantii* (DC.) Fr., *Paxillus panuoides* Fr. and *Lentinus lepideus* Fr., the last-named forming abortive sporophores consisting of branched rounded stipes entirely lacking any pileus. *Lenzites sepiaria* (Wulf.) Fr. appears to occur less frequently in this country than in Central Europe, but fructifications both of the more or less normal form or consisting of small branched antler-like growths (Pl. 3, fig. 1) are occasionally received.

The smaller species of *Merulius* belonging to the *Gyrophana* group (which includes *Merulius lacrymans*) are rare and appear to be of little practical importance in buildings in this country. *M. pinastri* Fr. has once been recorded from buried wood in a cellar and *M. himantioides* Fr. occurs occasionally.

Trametes serialis Fr. has been found on a number of occasions usually in resupinate form. There has been confusion over the identity of this species, and it has probably been mistaken for *Polyporus destructor*, which is a doubtful species. *Trametes serialis* is effused, reflexed and definitely striate—the upper surface usually brown and the flesh white and corky; the spores are $8 \times 2.5 \mu$.

Poria monticola Murr. (= *Poria microspora* Overholts), formerly considered a form of *Trametes serialis*, is not uncommon on timber imported from

Canada in which it causes an active cubical brown rot. The sporophore is an effused pore layer which is rather fragile and liable to disappear in a short time. The spores measure $5 \times 2.5-3 \mu$. The culture which has been described in detail by Cartwright (1930) is characteristic.

Poria xantha Lind. is one of the principal causes of decay in the timber of glasshouses and of conservatories attached to buildings.

Phellinus megaloporus (Pers.) Heim (*Poria megalopora* Pers.), formerly referred to as *Phellinus* (*Fomes*) *cryptarum* Karst., has not been recorded in the field in this country, and is regarded in France as typically an inhabitant of worked timber in buildings. Only recorded about twenty years ago in this country it has since been found in a dozen or more buildings, invariably on oak, in which it can cause an active white stringy rot. Wood decayed by this fungus is readily attacked by the death-watch beetle. A very similar type of decay is brought about by *Poria medulla-panis* Pers.

Fomes ferruginosus (Schröd.) Masee also causes a stringy white rot in oak that has been saturated with moisture, and can also attack coniferous wood—it is readily distinguished from *Phellinus megaloporus* by the presence of many setae.

External woodwork such as window sills and half timbering is liable to become infected by a number of fungi that do not normally occur inside buildings. *Polystictus versicolor* (Linn.) Fr. is not uncommon on hardwood sills into which moisture has been penetrating, and *Daedalea quercina* (Linn.) Fr. has been found causing a brown cubical rot in oak window sills.

Fungi that have infected timber during air seasoning may sometimes develop in a house on timber used in a partially seasoned condition—of these *Peniophora gigantea* (Fr.) Masee is probably the commonest and the tufted yellowish white mycelium of this fungus is often found on the sapwood of rafters and gives rise to needless alarm for it never seems to make any further progress on timber that has been seasoned, even if re-wetting occurs.

Fomes roseus (A. & S.) Fr. has been found on at least two occasions causing brown rot in floor boards, its fruit bodies shaped like malformed small potatoes were blackish on top and had pinkish pores and tough pinkish flesh throughout.

Daldinia concentrica was unexpectedly found on two occasions, fructifying on the underside of Canadian maple flooring. This fungus appears in other countries to have a wider host range than in Great Britain where it is rarely found on any wood other than ash.

Coprinus spp. occur not uncommonly in very damp basements and the mycelial form *Ozonium aurantiacum*, which is so often found on damp firewood such as old elm logs, occasionally appears on structural woodwork.

Asterostroma ochroleucum Bres. has been found on several occasions on very damp wood in cellars. It appears usually to grow on wood that has been decayed by some other fungus and it may fructify on the adjoining brickwork. The sporophore consists of a thin, soft ochre-coloured skin with a white margin and a somewhat powdery look. It is readily recognized under the microscope by the presence in the trama of numerous star-shaped cells which usually have five long, pointed rays.

Some fungi appear to be able to grow on old brickwork in which there is



Fig. 1.



Fig. 2.

le or no timber. *Merulius molluscus* Fr. has twice been found fructifying brick arches in which no timber was visible.

Damp plaster appears to be an excellent medium for the growth of species of *Peziza*, similar in appearance to *P. vesiculosa*. In houses exposed to the weather by bomb damage large numbers of the fructifications of this fungus have been seen on the ceilings. This species has, of course, no effect on the woodwork but its appearance may alarm builders on the lookout for symptoms of dry rot.

Deposits of the spores of certain Myxomycetes are occasionally the subject of inquiries. A heavy deposit of black dust thought to be associated with a leakage of soot baffled chemical analysis, but microscopic examination revealed it to consist of the spores of *Fuligo septica* Gmel.

A wide range of moulds may grow on damp wall-paper, plaster and brickwork, but the microflora of building materials has not been sufficiently studied to make even a preliminary list possible.

Probably the most surprising find yet recorded from a building was a very large specimen of the giant puff ball, *Lycoperdon giganteum* (Batsch.) Pers., which developed on the ground 5 ft. below the floor of a church in Kent. It was in a perfect state of preservation though quite ripe and dry (Pl. 3, fig. 2).

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EXPLANATION OF PLATE 3

Fig. 1. *Lenzites sepiaria*, abortive fruit bodies, growing in a house. (Natural size.)

Fig. 2. *Lycoperdon giganteum*, sporophore from beneath church floor.

LIST OF DISCOMYCETES RECORDED FROM THE BRITISH ISLES

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INTRODUCTION

This is the fifth list of fungi to be compiled according to the plan suggested by the Plant Pathology Committee (*Trans. Brit. mycol. Soc.*, xxiv, 126, 1940), whereby the fungi listed were to be those recorded for the British Isles, whether given in British or foreign publications, and any general references providing new information were to be included.

The classification and nomenclature followed is that of E. Boudier's *Histoire et Classification des Discomycètes d'Europe*, 1907, as adapted by J. Ramsbottom (*Trans. Brit. mycol. Soc.*, iv, 343-381, 1914), for the British species. Boudier's system is distinguished by his division of the Discomycetes into two great groups, the Operculeae and Inoperculeae, depending on the method of opening of the ascus, i.e. whether by means of a lid (operculum) or by means of a pore, respectively. Speaking generally, certain other characters tend to be correlated with these two criteria. In the Operculeae the spores are generally relatively large, simple, with rounded ends and frequently rough or warted, the hymenium is often waxy and the species frequent earth, dung, old unsound wood; whereas Inoperculate species tend to have a small septate, smooth and often elongate spore, and their habitats are dead or living stems and leaves, rarely soil.

Boudier's classification has been followed, with or without modifications, by a number of systematists, e.g. L. J. Grelet and Marcelle Le Gal in France, J. A. Nannfeldt in Sweden, F. J. Seaver in the U.S.A., and by most British mycologists in recent years (Carleton Rea, J. Bayliss Elliott, J. Grainger, A. E. Ellis, etc.), and it is the system adopted in compiling the foray lists in these *Transactions*. However, it has not found favour in text-books where a classification based largely on gross morphology is preferred; and for the practical work of identification the works of H. Rehm (Rabenhorst's *Kryptogamen-Flora*, i, 3, 1887-96) and of P. A. Saccardo (*Sylloge Fungorum*) with their full descriptions are indispensable.

Since Ramsbottom's compilation there has been no work in this country dealing with the group as a whole, although a considerable number of new and interesting species have been described and recorded, chiefly by the British authors mentioned above; in addition, J. A. Nannfeldt, while working in London, examined the collection of British Discomycetes in the herbaria at Kew and the British Museum (Nat. Hist.), and published

* Originally I undertook the compilation of this list, but owing to pressure of official duties was unable to make any progress, and so asked Mrs Balfour-Browne to take over. The list is almost entirely her work; my part has been mainly advisory and critical and it is with some reluctance that I have agreed to appear as joint author.—J. RAMSBOTTOM.

observations in the *Transactions*, **28** (xx, 191-207, 1936; xxiii, 239-253, 39). His comments, taxonomic and nomenclatural, are cited in the following list as giving the most recent interpretation of the species in question. Nannfeldt's work on Discomycetes is perhaps the most significant since Boudier's time. His *Studien über die Morphologie und Systematik der nichtlichenisierten Inoperculaten Discomyceten*, Uppsala, 1932, is of value as a study not only of the structural relations, particularly of the excipulum, of this group but of the classification and relationship of Ascomycetes generally, and moreover it includes a useful bibliography. He divides the higher Ascomycetes into three groups: Plectascales, Ascoloculares and Helotiales. The last include higher Pyrenomycetes as generally understood, and Discomycetes subdivided into the Operculati and Inoperculati. The Inoperculati comprise Lecanorales, Ostropales and Helotiales.

As the present list was about to go to press R. W. G. Dennis's *Revision of British Hyaloscyphaceae* was received. His findings have been incorporated. He adopts Nannfeldt's classification.

J. Lagarde, **102** (iv, 125-256, 1906) and E. J. Durand, *Bull. Torrey Bot.*, vol. xxvii, 1900, also did important research from a morphological and taxonomic point of view, as did E. J. H. Corner, **28** (xiv and xv) more recently.

In the last few years many papers on Discomycete classification and structure have appeared in America, notably those of F. J. Seaver, H. H. Hetzel, W. L. White, etc., (v. *Mycologia* and *Farlowia*). In France, Le Gal has cleared up several problems, especially some presented by Helotiales and Dasyscyphaceae (*Rev. mycol.*); L. J. Grelet has worked largely on the pericleae and M. Chadeaud on the structure of asci and spores. Velenovsky, in his *Monographia* (1934), adopted Rehm's system as he considered that Boudier's classification produced much chaos and confusion: whether this is so or not Velenovsky contributed to it by refusing to follow any International Rule of nomenclature including that of effective publication.

For references to the older systematic work Ramsbottom's 'Some Notes on the History and Classification of the Discomycetes', in **28** (iv, 382-404, 14) should be consulted.

As is to be expected, some parts of the British Isles have been searched for Discomycetes more thoroughly than others; these well-worked areas are mostly those native to some of our great mycologists or naturalists of the past, who, in addition to their own collecting, often by their enthusiasm inspired their local Natural History Societies to great efforts in gathering fungi. To mention a few: J. Lightfoot (**95**), W. J. Hooker (**92**), R. K. Reville (**51** and **39**), J. Stevenson (**13**), J. W. H. Trail and D. A. Boyd (**40**) collected in Scotland; J. Bolton (**111**), G. Masee and C. Crossland (**7**) in Wiltshire; W. Phillips (**11**) very largely in Shropshire; C. Bucknall (**46**) in the Bristol district; Irish lists have been compiled in the past by T. Taylor and J. Templeton (*Ann. Mag. nat. Hist.* v, 1840), H. W. Lett (*Proc. Belfast Nat. Fld. Cl.*, Appendix 1884-5) and more recently by J. Adams, G. H. Athybridge, H. C. Hawley, C. Rea, A. E. Muskett, E. N. Carrothers, Cairns (**71**) and P. O'Connor (**70**). Many general floras include lists

of Discomycetes, e.g. W. Hudson's *Flora Anglica*, R. Relhan's *Flora Cantabrigiensis*, J. Sibthorp's *Flora Oxoniensis*, Berkeley's *Fungi* in J. E. Smith's *English Flora*, W. Withering's *Arrangement* (38), and T. Purton's *Botanical Description* (55). The more up-to-date floras generally include no fresh records and are compiled from older lists.

Some of the authors just mentioned follow one system of classification, others another, e.g. Hudson and Lightfoot followed Linnaeus as did Withering in his first edition while adopting Pierre Bulliard's system in the second; Hooker chose Persoon's system, Berkeley preferred that of Fries; Phillips on the whole favoured Saccardo's *Conspectus*, with Massee and others for a considerable time taking their lead from Phillips.

Illustrations of British Discomycetes, many very excellent, are provided by J. Bolton (111), J. Sowerby (42), R. K. Greville (51) and M. C. Cooke (41). The last named often made drawings from type specimens loaned by continental herbaria, and in consequence of the dried state of the material, his colours and measurements are not always reliable. For beautiful and accurate drawings of Discomycetes, mostly gathered in France, Boudier's *Icones Mycologicae* cannot be equalled. His measurements in his descriptions were said by Maire 117 (XLII, 43, 1926) to be one-tenth too large owing to a faulty calibration of his micrometer, but Le Gal (*Rev. mycol.* n.s. II, 151), having remeasured a number of Boudier's own specimens, concludes that for the majority of these Boudier's measurements are correct.

Two groups of doubtful affinity are also listed below: the Exoascales which were included under Boudier's *Operculeae immarginatae* and the Tuberales which he did not admit into his classification of Discomycetes.

The Tuberales are now generally classified with Discomycetes. Some authors regard *Sphaerosoma*, and others *Sepultaria*, as the link between the two orders. G. Malençon's paper 'Les Truffes' in *Rev. mycol.* III, n.s., Mem. No. 1, and H. Lohwag's 'Tuberineen Studien' in 102 (xxxvii, 455-504) should be consulted for recent work on the structure and classification of the Tuberales. E. Gäumann in *Die Pilze*, 1949, also indicates possible lines of evolution in this group.

The Exoascales, on the other hand, have been so much altered by their parasitic mode of life that our knowledge of their relationship is not clear.

Generally speaking, species delimitation in the Discomycetes varies from family to family and genus to genus, depending largely on the state of our knowledge of the groups in question. Not only detailed morphological, cultural (Imperfect stages, etc.) and genetical research needs to be done in most of the groups, but a solution of some of the taxonomic problems might result from ecological (biology, parasitism) and population studies, and from a wider recognition of polytypic species, e.g. among Dasyscyphae and Helotieae.

Method of citation. As already mentioned, Ramsbottom's 'A List of the British Species of Discomycetes arranged according to Boudier's System', 28 (iv, 343, 1914), is taken as the basic work and the first citation, where possible, is generally a reference to it. Following this, the references are generally given roughly in reverse chronological order, i.e. the most recent first, for each specific name or synonym. Dates are not given except (i) in the reference to the first record of the fungus in this country when the date

placed after the page number, e.g. *Hyaloscypha candida* (Cooke) Boud....*Peziza*—Cooke in **14** (i, 130, 1873), and (ii) to references to periodicals which have no volume number, the date then precedes the page number (except again for a first British record), e.g. *Helotium amenti* Batsch ex Fr.) Fuckel...**37** (1907, 240).

Reference is not made to mention of species in general text-books or foreign works unless of special significance taxonomically, biologically, genetically, etc. An asterisk (*) (except in references to Berkeley's and Broome's Notices (**19**) when it retains Berkeley's and Broome's significance) indicates an illustration of a specimen collected in Britain. A dagger (†) indicates an illustration of a non-British specimen. Habitats are mentioned, at localities only when but one or two collections are known. The Boudier-Ramsbottom **28** (iv, 343–81) nomenclature is followed with the exception that to the citation of pre-Friesian authorities is added the name of Fries if the epithet appears in the *Systema*, or the name of the first later author to use it. No attempt has been made to correct the nomenclature: so many problems of nomenclature and taxonomy require consideration that we prefer to leave them for separate treatment. Thus *Mitrophora hybrida* (Sow.) Boud. becomes *Mitrophora hybrida* (Sow. ex Grev.) Boud. and we have disregarded the fact that Fries used the name *Morchella semilibera* DC. in the *Systema* for this species. Synonyms are quoted without their authorities unless there is a possibility of confusion, or if a question of a homonym arises. Reference is not made to the papers giving the original description of a species unless the original specimen was found in this country, when it is generally cited thus 'Cooke in **14**...'. References to the original accounts of most of the species will be found in Boudier (1907).

In the following list the families are arranged in the same order as in Ramsbottom's list, **28** (iv, 343), but the genera within each family are given alphabetically, as are the species within each genus.

Such Discomycetes, or so-called Discomycetes, until recently treated as lichens have not been included here. They have been listed and well annotated by W. Watson in **28** (xxxI, 307–15) together with fungus parasites of lichens, and to add them to the present list would be merely repetition. Moreover, there is still doubt as to the true nature of many of them.

In conclusion, we wish to emphasize that no attempt has been made to revise the synonymy or the group in any way: that this list is in fact merely a compilation of previous work and includes many names of doubtful status. A critical examination of this group of fungi is much needed.

Our thanks are gratefully recorded to those members of the Society and others who sent references to us.

LIST OF SPECIES

OPERCULEAE MARGINATAE

MORCHELLACEAE

- Mitrophora fusca** (Pers. ex Lambotte) Lév. **28** (xiii, 253, 1928); **108** (viii, Appendix, 112); Boudier, Icones, pl. 217†. On moist ground, Devil's Den, Worcestershire.
- **gigas** Lév. **28** (iv, 364); **115** (13); **35** (1899, 276; 1920, 238*); **8** (iv, 474); *Morchella*—Ramsbottom, Handbk., 180; **102** (xxxv, 220, spore discharge); **11** (6); **14** (viii, 98; ix, 47); **109** ('1880', publ. 1887, 264, spore discharge); **41** (pl. 86, fig. 323†); **19** (vii, No. 1921*, 1881); *Phalloboletus esculentus*—Micheli, Nov. Pl. Gen. pl. 84, fig. 1†. On the ground, especially in sandy places.
- **hybrida** (Sow. ex Grev.) Boud. **28** (iii, 234; iv, 364; x, 130); **115** (13); **102** (iv, 166); Boudier, Icones, pl. 216†; *Morchella*—**117** (xliii, 211, nomenclature); **39** (pl. 89*); **51** (418); **120** (662); *Helvella*—**55** (679); Sowerby in **42** (pl. 238*, 1799); *Morchella semilibera*—Ramsbottom, Handbk., 180; **35** (1896, 232); **40** (iv, n.s., 128); **11** (7); **41** (pl. 85, fig. 321*); **13** (295); **15** (656); **56** (xxviii, 507); **18** (358); **20** (183); *Mitrophora semilibera*—**7** (246); **27** (L, 189); **8** (iv, 474); **48** (xv, 158); *Mitrophora rimosipes*—**115** (13); **28** (i, 196); **35** (1901, 189); *Morchella rimosipes*—**41** (pl. 85, fig. 322†); *Phalloboletus esculentus*—Michelio, Nov. Pl. Gen., pl. 84, fig. 2. Exs.: Cooke, Fung. Brit., Ed. 2, No. 361; **43** (No. 51). On the ground, in woods, hedges, etc.
- **patula** (Pers. ex Fr.) Boud. **117** (xiii, 150); *Morchella*—**15** (656); **18** (358); **20** (183); **120** (662); **42** (pl. 51*, 1796). British specimens in the Herb. B.M. under this name are all *M. semilibera*. In woods.
- Morchella conica** Pers. ex Fr. **28** (iv, 364); Ramsbottom, Handbk., 179; **115** (13); Buller, Researches (vi, 314, spore dispersal); **102** (iv, 163, morphology and anatomy; xxxv, 219, spore sizes); Boudier, Icones, pl. 205†; **11** (4); **41** (pl. 81, fig. 315*); *M. esculenta* var. *conica*—**19** (vii, No. 553, 1851). On the ground.
- **crassipes** Krombh. **28** (iv, 364); **115** (13); Ramsbottom, Handbk., 179; **108** (viii, 321); **102** (xxxv, 219, spore-sizes); Boudier, Icones, pl. 194†; **8** (iv, 475); **54** (iv, 731); **11** (5); **41** (pl. 84, fig. 319*); **15** (656); **19** (xviii, No. 1151, 1866); *Morchella bohémica*—**35** (iii, old series, 19). On the ground, hedgerows, etc.
- **deliciosa** Fr. **28** (iv, 364); **115** (13); **102** (iv, 165); **65** (x, 440); **41** (pl. 84, fig. 320†); **13** (294); **40** (v, 22, 1879); *M. conica* var. *deliciosa*—**11** (15); as *M. conica*—**8** (iv, 477*). In grassy places, on the ground.
- **elata** Fr. **28** (iv, 364); **115** (13); Rev. mycol. (i, n.s. Suppl. 2, 8, key); Ramsbottom, Handbk., 179; **102** (xxxv, 219, spore sizes); Boudier, Icones, pl. 213†; **8** (iv, 476, 1895); **41** (pl. 82, fig. 317†). In fir woods.
- **elata** var. **purpurascens** (Krombh.) Boud. **28** (v, 255, 1916); Glasg. Nat. (viii, 54); Boudier, Icones, pl. 214†. In sandy soil, Dumbartonshire.
- **hortensis** Boud. **28** (iv, 315, 1914; iv, 364); Rev. mycol. (i, n.s., Suppl. 2, 8, key); **108** (viii, Appendix, 112); Boudier, Icones, pl. 204†. On the ground, Nottingham.
- **rotunda** [Pers.] Boud. **28** (iv, 314 & 364; xx, 1); **102** (iv, 157, structure); Boudier, Icones, pl. 195†; *Morchella esculenta* var. *rotunda*—**40** (iv, n.s., 128); **11** (4); **41** (pl. 81, fig. 313†); **39** (pl. 68*); *Morchella esculenta*—Ramsbottom, Handbk., 178; Buller, Researches (vi, 310, heliotropism and spore dispersal); **70** (i, n.s., 297); **27** (xvii, 362; L, 189); **23** (xv, 431); **102** (iii, 135, cytology; xxxv, 219, spore size); Rev. gén. Bot. (xvi, 209, conidia and sclerotia); **8** (iv, 476*); **56** (xxviii, 506); **11** (3*); **40** (iv, n.s., 128); **41** (pl. 81, fig. 312*); **15** (655*); **46** (vi, 277); **18** (358*); **58** (155); **20** (182); **51** (417); **39** (ii, pl. 68*); **92** (ii, 36); **120** (i, 661); Hussey (i, pl. 13*); Badham (ii, pl. 12, fig. 6*); *Helvella esculenta*—**42** (pl. 51*, (left-hand fig.), 1796); **55** (Appendix, iv, 453); **95** (v, 1043); *Phallus esculentus*—**111** (ii, pl. 91*); Relhan, Fl. Cantab. (1785, 462); **38** (Ed. 1, ii, 771); Hudson, Fl. Anglica (Ed. 1, 498); *Fungus faviginosus*—Ray, Synopsis, Ed. 3, 11, No. 7; Parkinson, Theat. Bot., folio 1640, 1317. In woods, on sandy soil.
- **rotunda** var. **cinerea** Boud. **28** (iv, 315, 1914; iv, 364). On the ground, near Cork, Ireland.

- Morchella Smithiana** Cooke 28 (iv, 364); 115 (13); Ramsbottom, Handbk., 179; 11 (5); 56 (xxviii, 507); 14 (viii, 99; xii, 98); 41 (pl. 83, fig. 318*); *Morchella crassipes* var. *Smithiana*—8 (iv, 476); as *M. crassipes*—27 (vi, 1*, 1868). On the ground.
- **vulgaris** [Pers.] Boud. 28 (iv, 315 & 364); Rev. mycol. (n.s., i, Suppl., 2, 6, key); 35 (1930, 303*); 117 (xiii, 139, synonymy); Boudier, Icones, pl. 202†; 120 (i, 662). On the ground.

HELVELLACEAE

- Gyromitra gigas** (Krombh.) Cooke 28 (iv, 364); 115 (13); Ramsbottom, Handbk., 180; Boudier, Icones, pl. 221†; 117 (xxviii, 136); 8 (iv, 478*); 11 (9); 41 (pl. 88, fig. 327*); 19 (xv, No. 1476); *Helvella*—15 (657); 19 (xv, No. 1060); 27 (xvii, 362); 45 (xxiv, 152*, 1863). On the ground.
- **Phillipsii** Mass. 28 (iv, 364); Ramsbottom, Handbk., 180; 8 (iv, 478); 27 (xxxi, 129*, 1893, as *G. gigas* (Krombh.) Cke.); *Durandiomyces*—100 (xxv, 157†); 48 (viii, 272); *Daleomyces*—Seaver, N. Amer. Cup Fungi, Suppl., 337. *Aleuria proteana* var. *Sparassoides* Bond. 117 (xv, 51). Under beeches.
- Helvella cinerea** (Bres.) Rea in 28 (xiii, 254, 1928). On the ground, Burnham Beeches, Bucks.
- **crispa** Scop. ex Fr. 28 (iv, 364); 115 (13); Ramsbottom, Handbk., 181; 70 (i, n.s., 297); Boudier, Icones, pl. 225†; 33 (xxv, 243, cytology and ascus development); 102 (iv, 168, anatomy); Glasg. Nat., i, 140; 27 (xvii, 362); 56 (xxviii, 507*); 8 (iv, 458); 11 (10); 40 (iv, n.s., 128); 15 (658); 41 (pl. 41, fig. 159*); 18 (359*); Badham (pl. v, fig. 1); *Helvella leucophaea*—51 (417); 39 (iii, pl. 143*); as *Helvella mitra*—92 (ii, 31); 55 (Appendix, iii, 255*); 42 (pl. 39); 95 (ii, 1047); 38 (Ed. 1, ii, 771; Ed. 2, iii, 430); Relhan, Fl. Cantab., 463; Hudson, Fl. Anglica (Ed. 1, 498, 1762; Ed. 2, 632; Ed. 3, 632); *H. mitra* covered a number of species, see *H. lacunosa* and *H. elastica*. Exs.: Berkeley, 'Brit. Fungi', No. 264; Cooke, 'Fung. Brit.', Ed. 1, 555; Ed. 2, 541; 43 (No. 102). On the ground, in woods.
- **fusca** Gill. 28 (iv, 364); 115 (13); Ramsbottom, Handbk., 181; 7 (247); 8 (iv, 461). On the ground, among grasses.
- **lacunosa** Afz. ex Fr. 28 (iv, 364; xvi, 1; xx, 6); 115 (13); Ramsbottom, Handbk., 181; 7 (246); Boudier, Icones, pl. 228†; 102 (iv, 171, anatomy); 27 (xvii, 362); 40 (iv, n.s., 128); 11 (11*); 41 (pl. 41, fig. 160†); 46 (ii, pl. 1, 216); 15 (658); 18 (359); 20 (184); Badham (pl. 14, fig. 1*); as *Helvella sulcata*—Saccardo, Syll. Fung. (viii, No. 48); *H. mitra*—51 (417); 39 (i, pl. 36*); 92 (ii, 31); 55 (Appendix, iv, 451); 95 (ii, 1047); 38 (Ed. 6, iv, 406, 1776). On the ground, on burnt soil, in woods, spring and autumn.
- **monachella** Scop. ex Fr. 28 (iv, 22 & 364); Ramsbottom, Handbk., 181; 8 (iv, 460); 11 (14, 1887); 41 (pl. 93, fig. 335†). On sandy ground in woods, spring and autumn.
- **subcostata** Cooke 115 (13); Ramsbottom, Handbk., 181; 7 (247); 35 (1898, 359); 8 (iv, 461); 11 (13); 40 (iv, n.s., 129); 13 (296); 41 (pl. 41, fig. 162*, 1877); *Helvella costata*—in Herb. Berkeley, 1856. On the ground.
- **sulcata** Afz. ex Fr. 28 (iv, 364); 115 (13); Ramsbottom, Handbk., 181; 108 (viii, Appendix, 316); Boudier, Icones, pl. 229†; 102 (iv, 172, anatomy); 11 (11); 40 (iv, n.s., 129); 41 (pl. 41, fig. 161*); 13 (295); 15 (658); 19 (iii, No. 1826; xviii, No. 1152, xiii, No. 764); 120 (i, 662, 1821); as *H. lacunosa*—8 (iv, 459). On the ground, in woods, autumn.
- Leptopodia atra** (Koenig ex Fr.) Boud. 28 (iv, 364); 115 (13); Boudier, Icones, pl. 238†; 108 (viii, Appendix, 316); *Helvella*—Ramsbottom, Handbk., 181; 102 (iv, 173, morphology); 8 (iv, 465); 11 (16); 40 (iv, n.s., 129); 41 (pl. 43, fig. 167†); 14 (vi, 127); 19 (16, No. 1721, 1878). In damp woods, summer and autumn.
- **Cookeiana** Boud. 28 (iv, 364); 115 (13); Boudier, Icones, pl. 236†; as *Helvella ephippium*—Cooke in 41 (pl. 43, fig. 169*); not *H. ephippium* Lév. q.v. On sandy ground in spring.
- **elastica** (Bull. ex Fr.) Boud. 28 (iv, 364; xiv, 280, morphology); 115 (13); Boudier, Icones, pl. 232†; *Helvella*—Ramsbottom, Handbk., 181; Proc. Hampshire Fld Cl. (1910, 339); 28 (vi, 294, spore discharge); 7 (247); 27 (xvii, 362); Bot. Gaz. (xlix,

- 195, development); **8** (iv, 466); **11** (15); **40** (iv, n.s., 129); **41** (pl. 42, fig. 163*); **15** (659*); **18** (359); **19** (i, No. 86); **20** (184); *Helvella fuliginosa*—**41** (pl. 42, fig. 166†); **92** (ii, 31); **55** (Appendix, iii, 256); **44** (fasc., ii, 25); **42** (pl. 154*); **38** (Ed. 2, iii, 432); *H. mitra*—**111** (pl. 95*, 1789); *H. albida*—**120** (663). Exs.: Berkeley, 'Brit. Fung.', No. 266; Cooke, 'Fung. Brit.', No. 233. In moist woods and hedges.
- Leptopodia elastica** var. **guepiniioides** (Berk. & Cooke) Boud. **28** (iv, 364); **115** (13); *Helvella guepiniioides*—Ramsbottom, Handbk., 181; **28** (iii, 110); **8** (iv, 462); **36** (xxx1, 463*); **11** (5); Berkeley & Cooke in **41** (pl. 93, fig. 337*, 1789). Exs.: Berkeley & Cooke in 'Herb. Berkeley'. On the ground.
- **ephippium** (Lév.) Boud. **28** (iv, 364; xii, 79); **115** (13); *Helvella*—Ramsbottom, Handbk., 182; **7** (247); **8** (iv, 466); **11** (18); **15** (659); **18** (359); **19** (vii, No. 552, 1851); not *H. ephippium* of Cooke in **41** (pl. 43, fig. 169*) which is *Leptopodia Cookeiana* Boud. q.v. On the ground in woods, spring and autumn.
- **Klotzschiana** (Corda) Boud. **28** (iv, 364); **8** (iv, 462); **11** (18); **14** (x, 51); **41** (pl. 43, fig. 168†); *Helvella Klotzschii*—**19** (vii, No. 1921, 1881). In a fernery at Coed Coch.
- **pezizoides** (Afz. ex Fr.) Boud. **28** (iv, 364); **115** (13); Boudier, Icones, pl. 235†; *Helvella helvelloides*—**8** (iv, 464); *Peziza helvelloides*—**41** (pl. 48, fig. 190†); **14** (iii, fig. 6†); *Lachnea helvelloides*—**115** (16); **11** (206, 1887). In pine woods, among moss, etc.
- **pulla** (Holmsk. ex Fr.) Boud. **28** (iv, 364); **115** (13); *Helvella*—Ramsbottom, Handbk., 182; **8** (iv, 464); **54** (iv, 731); **41** (pl. 94, fig. 338†); **11** (17, 1887). On damp ground and rotting trunks, summer and autumn.
- Physomitra esculenta** (Pers. ex Fr.) Boud. **28** (iv, 364); **115** (13); **108** (viii, Appendix, 112); Boudier, Icones, pl. 224†; *Gyromitra*—Ramsbottom, Handbk., 180; Buller, Researches, (vi, 322, heliotropism); **62** (xviii, 347); Tr. Dumfr. & Galloway Nat. Hist. Soc. (xx, 97); Glasg. Nat. (viii, 55); **100** (xii, 1-5, synonymy); **7** (246); **8** (iv, 479*); **11** (8*); **40** (iv, n.s., 128); **15** (657*); **41** (pl. 89, fig. 328*); **18** (358); *Helvella*—**19** (iii, No. 825, 1859); Badham (ii, pl. 12, figs. 3-5). Exs.: **43** (no. 101). On lime dump, ground, sandy or scorched places, pine woods.
- **infula** (Schaeff. ex Fr.) Boud. **28** (iv, 364); **115** (13); Boudier, Icones, pl. 223†; *Helvella*—Ramsbottom, Handbk., 181; **8** (iv, 459); **11** (13); **14** (viii, 99); **41** (pl. 92, fig. 334†); **40** (v, 234; iv, n.s., 129); **54** (iii, 151, 1880; iii, 731). In woods.
- Verpa conica** Müll. ex Fr. var. **Relhani** (Sow. ex Fr.) Boud. **28** (iv, 364); *Helvella Relhani* Sowerby in **42** (pl. 11*, 1796); **38** (Ed. 3, iv, 340); Relhan, Fl. Cantab., Ed. 3, 551; *Verpa conica*—Ramsbottom, Handbk., 182; **11** (21); **18** (359); **15** (660); **20** (185); *Verpa Relhani*—**8** (iv, 470); *Relhanum conicum*—**120** (661). All the references are repetitions of Sowerby's description and recording of the specimens found by Relhan. On the ground, Gog Magog hills.
- **digitaliformis** Pers. ex Fr. **28** (iv, 364); **115** (13); Ramsbottom, Handbk., 182; **7** (248); **117** (iii, 80†); Boudier, Icones, pl. 220†; **8** (iv, 468*); **11** (19); **54** (iii, 731); **41** (pl. 101, fig. 364*); **15** (659*); **18** (359*); **19** (vii, No. 1921*); **20** (184, 1836). On banks and under hedges.
- **Krombholzii** Corda **28** (iii, 234, 1911; iv, 12 & 364); Glamorgan County Hist., i, 209. In woods.
- **Krombholzii** var. **rufipes** (Phill.) Boud. **28** (iv, 364); *V. rufipes*—Ramsbottom, Handbk., 182; **113** (i, 24); **54** (iv, 731); **8** (iv, 469); Phillips in **11** (20*, 1887). Exs.: **43** (No. 52) as *V. digitaliformis*. Hedge banks, in spring.
- **speciosa** Vitt. **14** (x, 51); **11** (21); **19** (vii, No. 1922, 1881). Berkeley and Broome record this doubtfully from Coed Coch; Cooke regarded these specimens as a form of *Verpa digitaliformis*; Phillips merely copied the record.

PEZIZACEAE

- Acetabula ancilis** (Pers. ex Fr.) Boud. **28** (iv, 364); Boudier, Icones, pl. 244†; *Peziza*—**105** (xx, 69); **117** (xl, 265, systematics); **8** (iv, 427); **40** (iv, n.s., 132); **14** (xvii, 44, 1888); **41** (pl. 58, fig. 229†). On damp ground.
- **calyx** Sacc. **28** (vi, 327, 1920); Boudier, Icones, pl. 248†; *Peziza*—**41** (pl. 47, fig. 184†); *Paxina sulcata*—Seaver, N. Amer. Cup Fungi, 1928, 204. On garden soil Weybridge.

- Acetabula cribrosa** (Grev.) Boud. 28 (iv, 364); *Peziza*—8 (iv, 430); 11 (80); 40 (iv, n.s., 133); 41 (pl. 107, fig. 381*); 13 (304); 20 (203); Greville in 51 (423, 1824); *Helotium*—65 (xii, 281); 15 (713); 18 (372). On gravelly or sandy soil.
- **leucomelas** (Pers. ex Gill.) Boud. 28 (iv, 364); Ramsbottom, Handbk., 186; 115 (14); Boudier, Icones, pl. 249†; 102 (iv, 178, anatomy); 8 (iv, 452); 14 (xvii, 44, 1888); *Paxina*—Seaver, N. Amer. Cup Fungi, 1928, 204. On the ground and on clay banks.
- **leucomelas** var. **Percevalii** (Berk. & Cooke) Ramsb. 28 (iv, 364); *Acetabula Percevalii*—8 (iv, 452); *Peziza Percevalii*—11 (45); 40 (iv, n.s., 131); 13 (301); 19 (15, No. 1721*); 14 (v, 59); 41 (pl. 49, fig. 192*); as *Peziza ciborium* var. *major*—19 (xv, No. 1479, 1875). On the ground, on lawns, etc.
- **vulgaris** Fuckel 28 (iv, 364); Ramsbottom, Handbk., 186; 115 (14); 102 (iv, 176, morphology); 7 (251); Boudier, Icones, pl. 243†; 8 (iv, 451); *Peziza*—20 (206); 42 (pl. 389, fig. 7*); *Peziza acetabulum*—11 (44*); 40 (iv, n.s., 131); 13 (300); 70 (i, n.s., 298); 41 (pl. 41, fig. 183*); 15 (665*); 18 (362); 20 (187); 42 (pl. 59); 38 (Ed. 1, ii, 775); Hudson, Fl. Anglica (Ed. 1, 499, 1762; Ed. 2, 635); *Paxina acetabulum*—Seaver, N. Amer. Cup Fungi, 1928, 202†; *Aleuria acetabulum*—115 (14); *Acetabula acetabulum*—102 (iii, 133, cytology); *Macroscyphus acetabuliforme*—120 (i, 672). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 556; Ed. 2, No. 182; 43 (No. 6). On the ground.
- Aleuria ampliata** (Pers. ex Fr.) Gill. 28 (iv, 365); 115 (14); Rev. mycol. (vi, n.s., Suppl. No. 3, 64†); Boudier, Icones, pl. 264†; *Peziza*—Proc. Hampshire Fld Cl. (1910, 339); 27 (L, 189); 8 (iv, 432); 40 (iv, n.s., 133); 11 (78, 1887); 41 (pl. 108, fig. 384†). On rotting wood and bark.
- **ampliata** var. **linteicola** (Phill. & Plowr.) Boud. 28 (iv, 365); 115 (14); *Infundibulum*—Velenovsky, 351; *Peziza linteicola*—Ramsbottom, Handbk., 188; 35 (1904, 360); 8 (iv, 428); Phillips & Plowright in 11 (64, 1887); *Geopyxis cocotina* var. *linteicola*—8 (iv, 381). On damp sacking and rotting linen.
- **bovina** (Phill.) Boud. 28 (iv, 365); *Peziza*—Phillips in 13 (308, 1879); 40 (iv, n.s., 135); 11 (101); 14 (viii, 100); *Humaria*—8 (iv, 423); *Humaria fimeti*—7 (261); 35 (1901, 188). On cow dung, August.
- **cerea** (Sow. ex Fr.) Gill. 28 (iv, 365); 115 (14); 62 (xviii, 347); Boudier, Icones, pl. 259†; *Peziza*—Ramsbottom, Handbk., 187; 27 (lxxviii, 288); 7 (253); 40 (iv, n.s., 133); 11 (74); 13 (303); 41 (pl. 64, fig. 244*); 70 (i, n.s., 298); 46 (vi, n.s., 33); 15 (670); 19 (xv, No. 1060*); 18 (363); 20 (188); 55 (687); Sowerby in 42 (pl. 3*, 1796); *Macroscyphus*—120 (i, 672); *Peziza vesiculosa* var. *cerea*—8 (iv, 426). On ground, tan-beds, lime waste dump, sand-bags, etc.
- **cerea** var. **cocotina** (Cooke) Boud. *Geopyxis cocotina*—8 (iv, 380); 40 (iv, n.s., 175); *Lachnea cocotina*—11 (206); *Peziza cocotina*—54 (iii, 746); 41 (pl. 99, fig. 356*); Cooke in 14 (v, 61, 1876). On coconut fibres and sawdust.
- **cerea** var. **flavida** (Phill.) Boud. *Peziza micropus* var. *flavida*—Phillips in 11 (64, 1887). On decayed wood.
- **Emileia** (Cooke) Boud. 28 (x, 1 & 6, 1924; xiii, 256; xvii, 1); Rev. mycol. (ii, n.s., 197†, taxonomy); Boudier, Icones, pl. 280†; 41 (pl. 106, fig. 379†). On burnt ground.
- **insolita** (Cooke) Boud. 28 (iv, 365); *Geopyxis*—Ramsbottom, Handbk., 186; 8 (iv, 380); *Peziza*—11 (45); 40 (iv, n.s., 131); 13 (301); Cooke in 41 (pl. 104, fig. 375*, 1879). On decaying leaves.
- **isabellina** (W. G. Sm.) Boud. 28 (iv, 365); Boudier, Icones, pl. 278†; *Peziza*—Ramsbottom, Handbk., 187; 8 (iv, 429); 11 (63); 41 (pl. 63, fig. 241, from Smith's drawing); 14 (i, 136*, 1873). On decayed coniferous wood.
- **mellea** (Cooke & Plowr.) Boud. 28 (iv, 365); 115 (14); *Peziza*—8 (iv, 434); 11 (78); 41 (pl. 107, fig. 383*); Cooke & Plowright in 14 (v, 119, 1877). On rotting wood of ash.
- **micropus** (Pers. ex Fr.) Gill. 28 (iv, 365; vi, 246); 115 (14); Boudier, Icones, pl. 268†; 102 (iv, 184); *Otidea*—8 (iv, 444); *Peziza*—11 (63); 41 (pl. 78, fig. 300); 15 (671); 18 (364*, 1860). On decaying wood, also on rotting carpet.
- **muralis** (Sow. ex Phill.) Boud. 28 (iv, 365); *Geopyxis*—Ramsbottom, Handbk., 186; 8 (iv, 387); *Peziza*—11 (48); 14 (viii, 99); Sowerby in 42 (pl. 251*, 1800). On clay.
- **petaloidea** (Cooke & Phill.) Boud. 28 (iv, 365); *Geopyxis*—Ramsbottom, Handbk., 186; 8 (iv, 382); Cooke & Phillips in 11 (46, 1887). On the ground.
- **recedens** Boud. 28 (ii, 94; iv, 365); 115 (14); Rev. mycol. (vi, n.s., Suppl., 64†);

- Boudier, Icones, pl. 275†; **117** (xiv, 18); **7** (254); **35** (p. 4, 1904); Halifax Nat. (viii, 90, 1904). On cortex side of tub-garth, in stagnant pool, Halifax.
- Aleuria repanda** (Pers. ex Fr.) Gill. **28** (iv, 365; xiii, 166, heliotropism and conidial stage); **115** (14); **71** (xl, B, 50); *Peziza*—**27** (xvii, 363; L, 189; LXXVIII, 152); **11** (66); **40** (iv, n.s., 132); **15** (669); **18** (363); **20** (188, 1836); *Plicaria*—**46** (vii, ser. 4, 381). Some of the older records of this are probably *Aleuria varia* (Hedw. ex Fr.) Boud. q.v. On the ground, on tree-trunks and on sand-bags.
- **reperta** Boud. **28** (xiii, 255, 1928); **117** (x, 64). On rotting, decorticated wood.
- **sepiatra** (Cooke) Boud. **28** (iv, 365); **115** (14); *Peziza*—**115** (15); **8** (iv, 430); **11** (79); **40** (iv, n.s., 131); Cooke in **14** (iii, 119, 1875). On the ground in damp shady places, and on charcoal.
- **sterigmatizans** (Phill.) Boud. **28** (iv, 365); **115** (15); **8** (iv, 431); **11** (80); Phillips in **41** (p. 175, pl. 79, fig. 304*, 1879). On damp ground.
- **subcitrina** Bres. **28** (xiii, 255, 1928). On apple-pulp refuse, Ipplepen, Devon.
- **subrepanda** (Cooke & Phill.) Boud. **28** (iv, 365); *Peziza*—**8** (iv, 433); **11** (80); **41** (153, pl. 68, fig. 260*, 1879, Cooke & Phill. in herb.). On the ground, and on charcoal beds, etc.
- **tectoria** (Cooke) Boud. **28** (iv, 365); **115** (14); **37** (1920, 217); *Peziza*—**11** (77); **40** (iv, n.s., 133); **65** (xiii, 44*); **41** (pl. 68, fig. 263*); **46** (vi, 193); Cooke in **14** (iii, 119, 1874); *Peziza ampliata* var. *tectoria*—**8** (iv, 432). On damp floors and plaster walls, cellars.
- **umbrina** Boud. **28** (iv, 315 & 365); Rev. mycol. (vii, n.s., 82†, ascus pore structure); Boudier, Icones, pl. 279†; **100** (xxix, 652, as synonym of *Peziza pustulata*); *Peziza*—Ramsbottom, Handbk., 187; **41** (pl. 106, fig. 378†); **40** (iv, n.s., 132); **14** (xvii, 44, 1888). On charred wood.
- **umbrina** var. **assimilata** (Karst.) Boud. **28** (xiii, 256, 1928). Burnham Beeches.
- **undata** (W. G. Sm.) Boud. **28** (iv, 365); *Geopyxis*—**8** (iv, 387); *Peziza*—**11** (79); **41** (pl. 72, fig. 279*); W. G. Smith in **14** (i, 136*, 1873). On stems of tree-ferns in Veitch's Nursery, Chelsea.
- **varia** (Hedw. ex Fr.) Boud. **28** (iv, 365); Boudier, Icones, pl. 267†; as *Peziza repanda*—**39** (i, pl. 59, 1823); **51** (419); **8** (iv, 428). On the ground.
- **vesiculosa** (Bull. ex Fr.) Boud. **28** (iv, 365); **115** (14); Buller, Researches (vi, 286–304, heliotropism and dispersal); Boudier, Icones, pl. 257†; **102** (iv, 180, morphology); *Aleuria*—Viennot-Bourgin, Les champ. parasites, 1, 753; *Pustularia*—**102** (iii, 133, cytology); *Peziza*—Ramsbottom, Handbk., 187; **28** (iv, 242, conidia; xxiii, 282, nomenclature); **113** (1916, 5); **106** (xxvii, 39); **117** (xli, 396, nomenclature); **27** (xvii, 363; L, 189); Proc. Hampshire Fld Cl., 1910, 339; **33** (xiv, 363; xxii, 465, cytology); **70** (i, n.s., 298); **8** (iv, 425); **11** (73); **40** (iv, n.s., 133); **41** (pl. 63, fig. 242*); **15** (670); **18** (364); **20** (188); **39** (ii, pl. 107); **51** (49); **92** (ii, 33); **42** (pl. 4); **38** (Ed. 2, iii, 443); *Helvella*—**111** (pl. 175); Relhan, Fl. Cantab. (Ed. 3, 558, 1785); *Scodellina*—**120** (i, 669); *Peziza Lycoperdiovides*—Ann. Mag. nat. Hist. (v, 5). On rich ground, manure heaps, sand-bags.
- **violacea** (Pers. ex Fr.) Gill. **28** (iv, 365; xvii, 1); **115** (14); **108** (viii, Appendix, 315); Boudier, Icones, pl. 276†; *Peziza*—**11** (81, 1887); **41** (pl. 72, fig. 278†); *Humaria*—**115** (17); **28** (i, 120); **8** (iv, 417). On the ground and on charcoal.
- **viridaria** (B. & Br.) Quel. **28** (iv, 365); *Peziza*—**65** (xiii, 44); **11** (82); **109** (for year 1876, publ. 1880, 224); **41** (pl. 68, fig. 262*); **15** (672); **18** (364); Berkeley & Broome in **19** (vii, No. 555, 1851; vii, No. 1320*); *Humaria*—**8** (iv, 424). On damp walls and water-butts.
- Cyathipodia bulbosa** (Hedw. ex Fr.) Boud. **28** (iv, 364); *Helvella*—**8** (iv, 462); *Lachnea*—**11** (205); *Peziza*—**41** (pl. 48, fig. 189†); **14** (iii, pl. 27, fig. 8, 1874; viii, 99); *Ochtopora*—Hedwig, Laub-Moose, ii, pl. X, c†. On the ground, summer and autumn.
- **corium** (Weberb.) Boud. **28** (iv, 364; vi, 145, on sand dunes); **115** (13); **27** (L, 189); Svensk bot. Tidskr. (xxxii, 45, for relationships, etc.); Boudier, Icones, pl. 239 bis†; *Paxina*—Seaver, N. Amer. Cup Fungi, 1928, 208; *Cyathiporia*—**62** (xviii, 347); *Helvella*—**8** (iv, 463); *Lachnea*—**11** (204); *Peziza*—**14** (v, 59, 1876); **41** (pl. 48, fig. 187*). On sandy ground, on paper-mill lime-waste dump.
- **villosa** [Hedw.] Boud. **28** (vi, 63, 1918); Boudier, Icones, pl. 240†. On the ground, Weybridge.

- Discina leucoxantha*** Bres. var. ***fulvescens*** Rea in 28 (xiii, 254, 1928). Amongst grass, 20 yards from beech stump, nr. Perth.
- ***perlata*** Fr. 28 (iv, 365); 115 (14); Boudier, Icones, pl. 252†; *Peziza*—117 (xl, 265, systematics); 8 (iv, 435); 14 (xviii, 82, 1890); 41 (pl. 41, fig. 239†). On charcoal heaps.
- Disciotis venosa*** (Pers. ex Fr.) Boud. 28 (iv, 365; x, 129; xi, 5); 108 (viii, 344); Boudier Icones, pl. 254†; *Discina*—100 (ix, 53†); 105 (lxiii, 50†); *Peziza*—115 (15); 7 (254); 105 (xx, 69); 27 (xvii, 363); 8 (iv, 431); 11 (69); 40 (iv, n.s., 132); 41 (pl. 58, fig. 228*); 15 (666); 13 (301); 18 (362*); Hussey, II, pl. 7, 1855; as *Peziza ancilis*—41 (pl. 103, fig. 372*). On the ground.
- ***venosa*** var. ***reticulata*** (Grev. ex Fr.) Boud. 28 (iv, 365); 115 (14); Boudier, Icones, pl. 255†; *Peziza reticulata*—115 (15); 105 (xx, 69); 8 (iv, 426); 11 (67); 40 (iv, n.s., 132); 41 (pl. 58, fig. 227†); 14 (xxii, 99); 13 (302); 20 (187); Greville in 39 (iii, 156*, 1825); *Peziza venosa* var. *reticulata*—106 (xxvii, 83). On the ground.
- Galactinia Adae*** (Sadler) Boud. 28 (iv, 365); 115 (14); *Peziza*—37 (1913, 197); 8 (iv, 433); 35 (1891, 348); 11 (62); 40 (iv, n.s., 132); 13 (303); 65 (xiii, 45*, 1879); 46 (vi, n.s., 33); 14 (vi, 75*); *Peziza domiciliana*—31 (1877, 793); 100 (xxxii, 53, growth of ascocarp); 65 (xiii, 46*). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 649; 43 (No. 154). On damp walls; on soil in propagating pit at Kew.
- ***ampelina*** (Quél.) Boud. 28 (iii, 377, 1912; iv, 12 & 365); Boudier, Icones, pl. 300. On bare soil, near rotten stump of *Abies excelsa*, Hants.
- ***badia*** (Pers. ex Fr.) Boud. 28 (iv, 365); 115 (14); Buller, Recherches (vi, 304, spore discharge); Boudier, Icones, pl. 283; *Peziza*—27 (xvii, 363); 8 (iv, 436); 11 (58); 40 (iv, n.s., 131); 70 (i, n.s., 298); 41 (pl. 57, fig. 226); 15 (667); 18 (363*); 19 (xiii, No. 306*); 20 (187); *Scodellina*—120 (i, 669); as *Helvella cochleata*—111 (iii, pl. 99, 1789). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 208; Ed. 2, No. 366. On the ground.
- ***badio-fusca*** Boud. 28 (xiii, 257, 1928); 115 (14); Boudier, Icones, pl. 297†. On the ground.
- ***brunneo-atra*** (Desm.) Boud. 28 (iv, 194 & 365; vi, 145); Boudier, Icones, pl. 298†; *Peziza*—27 (i, 189); 11 (76); 41 (pl. 20, fig. 78†); 15 (677); 19 (xviii, No. 1157, 1866, with fig.). On the ground, on sand-dunes, etc.
- ***Howsei*** Boud. 28 (vi, 78, 1919; vi, 133); 115 (14); Rev. mycol. (ii, n.s., 199†). On the ground, Byram Park, Yorks.
- ***indiscreta*** (Phill. & Plowr.) Boud. 28 (iv, 365); *Peziza*—8 (iv, 439); 11 (73); 14 (viii, 99, 1880). On the earth under lime trees.
- ***ionella*** (Quél.) Boud. 28 (iii, 124, 1909; iv, 365); Boudier, Icones, pl. 301†; *Humarina Gerardi* (Cooke) Seaver, N. Amer. Cup Fungi, 1928, 138. On bare, heavy ground in a wood, Lincolnshire.
- ***lividula*** (Phill.) Boud. 28 (iv, 365); 115 (14); Rev. mycol. (iv, n.s., 170, structure and relations); *Peziza*—8 (iv, 437); 11 (76); 41 (161, pl. 72, fig. 277*, 1879, Phill. in litt.). On the ground in damp places.
- ***macrospora*** (Wallr.) Boud. 28 (iv, 365); *Humaria*—8 (iv, 422), *G. brunneo-atra* (Desm.) Boud., q.v., Massee regarded as a synonym; 41 (pl. 20, fig. 77†). On bare ground.
- ***Michellii*** Boud. 28 (xiii, 256, 1928); Boudier, Icones, pl. 286†. Amongst conifer needles, Bricket Wood, Watford.
- ***olivacea*** Boud. 28 (xiii, 256); Rev. mycol. (ii, n.s., 200†; vi, n.s., Suppl. 3); 108 (vii, 382, 1924; viii, 20); Boudier, Icones, pl. 282†; *Aleuria*—117 (xiii, 14; xli, 398, synonymy). On the ground, Wyre Forest.
- ***Phillipsii*** (Cooke) Boud. 28 (iv, 365; vi, 241); 115 (14); *Peziza*—41 (pl. 22, fig. 88*); 11 (90); Cooke in 14 (iv, 110, 1876); *Humaria*—8 (iv, 417); 35 (1906, 9); *Ascobolus amethystinus* Phill. in part, 14 (iv, 84); *Galactinia amethystina* (Phill.) Wakef.—28 (vi, 375); also v. *Ascobolus amethystinus* Phill. Damp sandy ground.
- ***pleurota*** (Phill.) Boud. 28 (iv, 365); *Otidea*—8 (iv, 443); *Peziza*—11 (51*); Phillips in 41 (208, pl. 97, fig. 351*, 1879). On cow dung.
- ***praetervisa*** (Bres.) Boud. 28 (v, 439, 1917); Glasg. Nat., viii, 188; Boudier, Icones, pl. 292†; 117 (xlvii, 105, karyokinesis). On rubbish heap, etc.
- ***proteana*** Boud. 28 (xiii, 257, 1928); 108 (viii, Appendix, 112); Boudier, Icones, pl. 293†. On charcoal heaps under yews and beeches.

- Galactinia pustulata** (Hedw. ex Fr.) Boud. 28 (iv, 365); 115 (14); *Peziza*—100 (xxix, 651, conidial stage); 8 (iv, 438); 11 (72); 40 (iv, n.s., 133); 15 (672); 41 (pl. 77, fig. 298*); 18 (364); 19 (xiii, No. 307); *Scodellina*—120 (i, 669, 1821); *Octospora*—Hedwig, Laub-Moose, (ii, pl. vi, fig. A†). On the ground, and on charcoal beds.
- **saniosa** (Schrader ex Fr.) Sacc. 28 (iv, 365; xiv, 264, morphology); 115 (14); Rev. mycol. (ii, n.s., 210†, especially spore structure); Boudier, Icones, pl. 295†; *Peziza*—8 (iv, 436); 70 (i, n.s., 298); 11 (70); 41 (pl. 77, fig. 299*); 15 (673); 14 (ii, 189*); 18 (366); 19 (i, No. 87, 1838, with fig.); Schrader in J. für Bot., Göttingen (ii, 64, 1799). On the ground and on trunks.
- **Sarrazinii** Boud. 28 (xiii, 257, 1928); 117 (iii, 147); 108 (viii, Appendix, 112 & 318); Boudier, Icones, pl. 291†. On burnt ground and charcoal heaps.
- **succosa** (Berk.) Sacc. 28 (iv, 365); 115 (14); Rev. mycol. (ii, n.s., 211†, spore drawings; v, n.s., 103†); Boudier, Icones, pl. 284†; 102 (ii, 126, cytology; iv, 187, morphology); 33 (xxii, 470, cytology); 36 (xxxi, 500); *Peziza*—8 (iv, 438); 36 (xxxi, 500); 11 (70*); 40 (iv, n.s., 133); 109 ('1874', publ. 1880, 42); 41 (pl. 63, fig. 243*); 15 (667); 14 (iii, 124); 18 (363); Berkeley in 19 (vi, No. 156, 1841, with fig.). Exs.: 43 (No. 10). On the ground.
- Geopyxis ammophila** (Dur. & Mont.) Sacc. 28 (iv, 366); Ramsbottom, Handbk., 186; 8 (iv, 385); *Peziza*—11 (49); 40 (v, 22, 1879; iv, n.s., 131); 13 (301); 41 (pl. 26, fig. 100†; pl. 104, fig. 373*); 14 (v, 59); 19 (i, No. 1721); *Peziza arenaria*—19 (vii, No. 1619, 1876); *Sarcosphaera*—Z. Pilzk., xvii, n.s., xxii old series, 13, stem is a rootlike prolongation composed of sand bound together by hyphae. Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 645. On sand, usually near sea coast.
- **carbonaria** (Alb. & Schw. ex Fr.) Sacc. 28 (iv, 366); 108 (viii, Appendix, 318); 115 (15); Ramsbottom, Handbk., 186; 117 (xxxviii, 93); 8 (iv, 383); *Peziza*—11 (49); 41 (pl. 74, fig. 284†); 15 (672); 19 (xv, No. 1063, with fig., 1865). On burnt ground and charcoal beds.
- **carnea** (Cooke & Phill.) Sacc. 28 (iv, 366); Ramsbottom, Handbk., 186; 8 (iv, 383); *Peziza*—Cooke & Phillips in 11 (48, 1887). As *Peziza cupularis* L. var. in Herb. Berk. On the ground.
- **majalis** (Fr.) Sacc. 28 (iv, 366); 8 (iv, 377); 41 (pl. 73, fig. 280†); *Peziza*—40 (56, 1893). On the ground.
- **pinetorum** (Fuckel) Boud. *Humaria*—28 (iv, 321); 37 (47*, 1906); *Peziza*—41 (pl. 11, fig. 43†). On fallen pine leaves, Kew.
- Lachnea argillacea** (Sow. ex Fr.) Sacc. 28 (iv, 366); *Peziza*—8 (iv, 439); 11 (109); 15 (673); 18 (366); 20 (190); 120 (i, 666); 42 (pl. 148*, 1798). On modelling clay, observed only by Sowerby; no existing specimen.
- **Eichleri** Bres. 28 (xiii, 258, 1928). On burnt soil, nr. Cambridge.
- **erinacea** (Schwein. ex Fr.) Sacc. 28 (iv, 366); 115 (16); 35 (1897, 347); 8 (iv, 322); *Peziza*—41 (pl. 36, fig. 140†); 14 (xxi, 70, 1893). On rotten wood.
- **hemispherica** (Wigg. ex Fr.) Gill. 28 (iv, 366); Rev. mycol. (ii, n.s., 213†; vii, n.s., 82†, structure of pore of ascus); 115 (16); 7 (264); Boudier, Icones, pl. 352†; 102 (iv, 199, morphology and anatomy); 27 (i, 190); 8 (iv, 318*); 11 (211); 40 (iv, n.s., 175); *Peziza*—15 (680); 41 (pl. 30, fig. 115†); 18 (367); 20 (193); 120 (i, 665); *Peziza hispida*—42 (pl. 147*); 38 (Ed. 2, iii, 444); Hudson, Fl. Anglica (635, 1778); *Octospora fasciculata*—Hedwig, Laub-Moose, (ii, pl. IV, e†). On the ground.
- **hemisphaerioides** Mont. 28 (vi, 328, 1919). On cinder heap in a wood, Somersetshire.
- **hybrida** (Sow.) Gill. 28 (iv, 366); Boudier, Icones, pl. 356; 8 (iv, 312); 11 (214); 40 (iv, n.s., 175); *Peziza*—46 (iv, n.s., 149); Sowerby in 42 (pl. 369, fig. 1*, 1802); as *P. brunnea*—20 (v, 193); 41 (pl. 32, fig. 126b*). On the ground.
- Lachnea** sp. Rep. Proc. Imp. Bot. Conf., London, 346–7, 1925, *Acinosporium* as Imperfect form.
- Leucoscypha fossulae** (Limm.) Boud. 28 (iv, 366); 115 (16); *Peziza*—41 (pl. 99, fig. 359†); *Neotiella*—7 (266); 8 (iv, 376, 1825). On bare ground.
- **nivea** (Romell) Boud. 28 (iv, 366); 115 (16); 54 (xv, 204); *Neotiella*—113 (1916, 5); 7 (266); 7A (285); 8 (iv, 375); as *Lachnea fossula*—35 (170, 1894). On decaying vegetable matter, pine leaves, clay path, etc.
- Macropodia macropus** (Pers. ex Fr.) Fuckel. 28 (iv, 364; xxii, 6); 115 (14); Ramsbottom, Handbk., 189; Boudier, Icones, pl. 239†; *Lachnea*—11 (207); 40 (iv, n.s.,

175); *Helvella*—7 (247); 8 (iv, 467); *Peziza*—27 (xvii, 363); 40 (iv, n.s., 132); 15 (666); 41 (pl. 48, fig. 188*); 18 (365); 20 (189); 51 (419); 39 (ii, pl. 70); *Macroscyphus*—120 (i, 672); *Paxina hispida*—Seaver, N. Amer. Cup Fungi, 1928, 205; *Peziza stipitata*—Hudson, Fl. Anglica (Ed. 2, 472 & 636, 1778); 38 (Ed. 2, iii, 436); 42 (pl. 38*). Exs.: Cooke, 'Fung. Brit.', No. 289; 43 (No. 152). On the ground in shady woods.

Otidea alutacea (Pers. ex Fr.) Mass. 28 (iv, 366); 115 (15); Ramsbottom, Handbk., 188; Boudier, Icones, pl. 327†; 8 (iv, 446); *Peziza*—11 (61); 41 (pl. 54, fig. 214†); *Scodellina*—120 (i, 668, 1821); *Peziza cochleata* var. *alutacea*—19 (xv, No. 1478). On the ground.

—**bufonia** (Pers. ex Fr.) Boud. 28 (iv, 366); *Peziza*—8 (iv, 429); 11 (75); 41 (pl. 76, fig. 292*); 15 (671); 19 (xviii, No. 1154); 31 (13 Jan. 1866, 34). On the ground and on rubbish heaps.

—**cochleata** (Linn. ex Fr.) Fuckel 28 (iv, 366), 115 (15); 7 (256); Boudier, Icones, pl. 329†; 102 (iv, 195, anatomy); 8 (iv, 445); *Peziza*—Ramsbottom, Handbk., 187; 27 (xvii, 363); 11 (60); 40 (iv, n.s., 132); 41 (pl. 54, fig. 212*); 46 (ii, pt. 2, 187); 15 (667); 18 (363); 20 (188); 55 (687, Appendix, iv, 461); 42 (pl. 5*); 38 (Ed. 2, iii, 441); 95 (Ed. 1, 1051, 1777; Ed. 2, 1051); *Peziza umbrina* Pers.—51 (419); *Scodellina umbrina*—120 (i, 668). On the ground.

—**concinna** (Pers. ex Fr.) Boud. 115 (15); 28 (xvi, 7, 1931); Boudier, Icones, pl. 325†. Mulgrave woods, Yorkshire.

—**concinna** var. **integra** Bres. 28 (v, 255*, 1916); Glasg. Nat. (viii, 54). On the ground in woods, Ayrshire.

—**grandis** (Pers. ex Gill.) Mass. 28 (iv, 366); Ramsbottom, Handbk., 188; 48 (xxvi, 55); Boudier, Icones, pl. 328†; 8 (iv, 446); *Peziza*—11 (61, 1887); 41 (pl. 105, fig. 376†). On the ground in pine woods.

—**leporina** (Batsch ex Fr.) Fuckel 28 (iv, 366; vii, 86, spore discharge); 115 (15); Ramsbottom, Handbk., 188; 8 (iv, 440); *Peziza*—11 (53); 70 (i, n.s., 298); 40 (iv, n.s., 131); 15 (668); 41 (pl. 54, fig. 211*); 18 (363); *Scodellina*—120 (i, 668, 1821). Exs.: 43 (No. 11); Cooke, 'Fung. Brit.', Ed. 2, No. 452. On the ground.

—**onotica** (Pers. ex Fr.) Fuckel 28 (iv, 365); 115 (15); 102 (iv, 193, anatomy); 8 (iv, 447); Boudier, Icones, pl. 324†; 109 (1873, 120, taxonomy); *Peziza*—11 (52); 70 (i, n.s., 298); 40 (iv, n.s., 131); 27 (vii, 346); 15 (668); 41 (pl. 53, fig. 210*); 18 (363); 20 (187); as *Peziza leporina*—42 (pl. 79, 1797); *Scodellina onotica*—120 (i, 668). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 365. On the ground in woods.

—**phlebophora** (B. & Br.) Sacc. 28 (iv, 366); 115 (15); 8 (iv, 445); *Peziza*—36 (xxxii, 520); 11 (55); 41 (pl. 55, fig. 217*); 15 (667); Berkeley & Broome in 19 (xviii, No. 1153, with fig., 1866). On clay banks.

—**violacea** A. L. Sm. & Ramsb. in 28 (v, 237, 1916; vii, 298); 27 (lx, 174). On burnt soil.

Pachyella Babingtonii (Berk.) Boud. 28 (iv, 365); 115 (15); *Rhizina*—7 (251); 8 (iv, 455); *Psilopezia*—11 (110); 15 (716); 18 (373); *Peziza*—Berkeley in 19 (vii, 2, No. 554, 1851). On rotten wood.

—**Barlaeana** (Bres.) Boud. 28 (iv, 365); 108 (viii, Appendix, 112); Boudier, Icones, pl. 310†; as *Peziza repanda*—41 (142, pl. 62, fig. 240*, 1879). On the ground.

—**depressa** (Phill.) Boud. 28 (iv, 365); 115 (15); Boudier, Icones, pl. 312†; *Peziza*—11 (101*); Phillips in 41 (pl. 110, fig. 392*, 1879); *Mollisia*—8 (iv, 205). A note by Nannfeldt in Herb. B.M. concerning the type, suggests that this belongs to *Psilopezia*, probably *P. nummularia* Berk. Also cf. Seaver's 'N. Amer. Cup Fungi', p. 106. Boudier (1907, 70) suggests that *Peltidium Oocardii* Kalchbr. may be a synonym. On dead branches of willow and beech on damp ground.

—**depressa** var. **pallida** Rea 28 (xii, 294, 1927); 108 (viii, Appendix, 112). On a log, at one time submerged, Barnt Green Reservoir, Worcestershire.

—**rhizinoides** (Rabenh.) Boud. Hist. et Class. Disc. d'Europe, 1907, 51 and as *Galactina*, p. 47. British record based on specimens in Herb. B.M. from W. W. Strickland, 19. vii. 1880, labelled *Patellaria olivacea* and identified by J. Nannfeldt as *Psilopezia rhizinoides* (Rabenh.) Rehm. Nr. third bridge, Boynton.

Peziza aurantia Pers. ex Fr. 28 (iv, 366; xiv, 264, morphology; xxiii, 282; nomenclature); Ramsbottom, Handbk., 187; Buller (Researches, vi, 334, 'puffing'); Boudier, Icones, pl. 313; 115 (15); 27 (xvii, 363; l, 190); 33 (xi, 339); 102 (iv, 196,

- anatomy); **117** (xli, 395, nomenclature); **11** (56); **40** (iv, n.s., 131); **15** (668); **18** (363); **68A** (v, 124); **20** (187); **51** (418); **73** (1, ser. 4, 205*); **109** (1869, 108); **92** (ii, 33); *Otidea*—**113** (1916, 5); **8** (iv, 448); **33** (xxii, 465–75, cytology; xxiii, 545); *Aleuria*—**100** (xix, 87); *Scodellina aurantiaca*—**120** (i, 668); as *Peziza coccinea*—Hudson, Fl. Anglica (Ed. i, 636, 1778; Ed. 2, 636); Relhan, Fl. Cantab., 465; **42** (pl. 78*); as *Helvella coccinea*—**111** (iii, pl. 100). Exs.: **43** (No. 12). On the ground in woods.
- Peziza congrex** Karst. **71** (xxviii, 132, 1909); **41** (pl. 110, fig. 395†); in Herb. B.M. there is 'half a cup', also drawings by W. Phillips. On the ground, Leinster.
- **cornubiensis** Berk. **28** (iv, 366); **41** (pl. 80, fig. 309*); **15** (673); **18** (365); Berkeley in **19** (xiii, No. 767, 1854); *Neotiella*—**8** (iv, 374); *Lachnea*—**11** (229*). On manured ground.
- **fibrillosa** Curr. **28** (iv, 366); Ramsbottom, Handbk., 187; **11** (60); **41** (pl. 53, fig. 207*); **15** (669); Currey in **45** (xxiv, 153, 1863); *Otidea*—**8** (iv, 449). On the ground.
- **luculenta** Cooke **28** (iv, 366); **115** (13); Ramsbottom, Handbk. (187, as '*leuculenta*'); **41** (pl. 53, fig. 208*); **13** (303); Cooke in **14** (v, 60, 1876); *P. leuculenta*—**11** (59); **40** (iv, n.s., 132); *Otidea leuculenta*—**8** (iv, 450). On the ground.
- **luteo-nitens** B. & Br. **28** (iv, 366); Ramsbottom, Handbk., 187; **115** (15); **106** (xvi, 287); Boudier, Icones, pl. 317†; **11** (58); **41** (pl. 52, fig. 205*); **15** (669); **18** (364); Berkeley & Broome in **19** (vii, No. 556, 1851); *Otidea*—**8** (iv, 449). On bare ground and on rubbish from threshing machine.
- **ollaris** Fr. **28** (iv, 366); **11** (102); **40** (iv, n.s., 135); **13** (370); **41** (pl. 14, fig. 56†); **19** (iii, No. 1828, 1879); *Humaria*—Seaver, N. Amer. Cup Fungi, 1928, 135; *Humaria*—**8** (iv, 412); *Aleuria*—**28** (xiii, 255). On the ground amongst moss, and in plant pots.
- **Polytrichi** Schum. ex Fr. **28** (iv, 366); Boudier, Icones, pl. 316†; **115** (15); **102** (xv, 353); **40** (iv, n.s., 133); **46** (vi, n.s., 277); **18** (366); as *Peziza rutilans*—**41** (pl. 15, fig. 57*); **15** (674); **14** (xxii, 108); **8** (iv, 406). This species has been frequently confused with *P. rutilans*, e.g. by Cooke, and Masee. The latter's account of '*Polytrichi*' fits Boudier's interpretation (here adopted) in microscopic features only, whereas macroscopically it is *P. rutilans* of Boudier. For additional interpretations of *P. polytrichi* Schum. see *Lamprospora polytrichi* (Fr. ex Schum.) Le Gal in **117** (lvi, 39).
- **rhénana** Fuckel **28** (iv, 366); **115** (15); Boudier, Icones, pl. 315†; *Otidea aurantia* var. *stipitata*—**4** (497); **8** (iv, 449); **11** (57, 1887). On the ground.
- **rutilans** Fr. **28** (iv, 366; v, 145, guttulae); **115** (15); Boudier, Icones, pl. 315†; **35** (xxii, 35 & 470; i, n.s., 655, cytology); **11** (89*); **40** (iv, n.s., 134); **18** (366); **19** (xviii, No. 1154*, with fig.); **20** (190, 1836); *Humaria*—**33** (xxi, 307, cytology); as *Peziza polytrichi*—**15** (675); **14** (xxii, 109*); as *Neotiella polytrichi*—**8** (iv, 370); **7** (265); *Neotiella ovilla* var. *flavodisca*—**14** (xxi, 70). Also see under *P. polytrichi*. On ground among moss.
- **Sowerbyi** Cooke **28** (iv, 366); *Helotium*—**8** (iv, 248); *P. Sowerbei*—**11** (92); Cooke in **41** (pl. 14, fig. 55*); as *Peziza araneosa* Sowerby in **42** (pl. 369, fig. 5*, 1802). According to Nannfeldt, **28** (xxiii, 240), *P. Sowerbyi* is a synonym of *P. subferruginea* Nyl. On bark and wood amongst moss.
- **vivida** Nyl. **28** (iv, 366); **40** (iv, n.s., 134); **11** (88); **13** (306); **41** (pl. 14, fig. 53†); **14** (iii, 120, 1875); as *Neotiella Polytrichi*—**8** (iv, 372); *Peziza rutilans* var. *vivida*—Trans. Perthsh. Soc. nat. Sci., vii, 6. Amongst moss, on sandy soil.
- Plicaria leiocarpa** (Curr.) Boud. **28** (iv, 365); **108** (viii, Appendix, 317); Boudier, Icones, pl. 304†; **117** (xxxiv, 31; xlvi, 107, cytology); *Peziza*—**11** (65); **19** (xv, No. 1062, with fig.); **15** (671); **41** (pl. 67, fig. 256*); Currey in **45** (xxiv, 493*, 1864); as *Curreyella trachycarpa* p.p. **8** (iv, 401). On burnt ground.
- **Persoonii** (Cr.) Boud. **28** (iv, 365; xii, 294); Boudier, Icones, pl. 308†; **115** (15); emend Lagarde—**117** (xxviii, 161); *Barlaea*—**28** (i, 152); **7** (258); **35** (Jan. 1900, 9); *Barlaea violascens*—**8** (iv, 398); *Peziza violascens*—**11** (88); **15** (698); **41** (pl. 21, fig. 83*, 1875); **14** (iv, 110). On damp ground with moss.
- **radula** (B. & Br.) Boud. **28** (iv, 365); **115** (15); *Peziza*—**11** (7*); **15** (672); **41** (pl. 76, fig. 293*); **18** (364); Ann. Mag. nat. Hist. p. 77, 1846; *Curreyella*—**8** (iv, 401). On the ground in woods.
- **trachycarpa** (Curr.) Boud. **28** (iv, 365); **115** (15); Boudier, Icones, pl. 305†; *Peziza*—**11** (65*); **15** (671); **41** (pl. 67, fig. 257*); **109** (1873, 113); **19** (xv, No. 1061, with fig.); Currey in **45** (xxiv, 493*, 1864); *Curreyella*—**7** (257). On burnt ground.

- Pseudoplectania nigrella** (Pers. ex Fr.) Fuckel 28 (iv, 366; vi, 145); Boudier, Icones, pl. 344†: 115 (16); *Sphaerospora*—7 (266); 8 (iv, 296); *Peziza*—41 (pl. 31, fig. 120†, 1876, appears to be the first mention in Great Britain, but fig. not from a British specimen). On the ground in pine woods, on rotten pine trunk and on sand-dune slacks.
- Pseudotis apophysata** (Cooke & Phill.) Boud. 28 (iv, 366); Boudier, Icones, pl. 332†; *Otidea*—8 (iv, 444); *Peziza*—11 (54); 41 (pl. 97, fig. 350*); Cooke & Phillips in 14 (v, 60, 1876). On damp earth and ditches.
- **radiculata** (Sow. ex Fr.) Boud. 28 (iv, 366); 115 (15); Boudier, Icones, pl. 334†; *Geophyxis*—7 (252); 8 (iv, 379); *Lachnea*—11 (202*); 40 (iv, n.s., 175); 54 (iv, 731); *Peziza*—13 (309); 41 (pl. 26, fig. 99*); 15 (680); 27 (vii, 346); 19 (xviii, No. 1160*, with fig.); 18 (367); 20 (192); Sowerby in 42 (pl. 114, 1797); ?*Geophyxis* Cookei—8 (iv, 378); ? var. *Percevali*—8 (iv, 379); *P. radiculata* var. *Percevali*—41 (pl. 80, fig. 311*); *Lachnea radiculata* var. *Percevali*—11 (203). Massee considered that Cooke's and Sowerby's illustrations represented different species; *Sowerbyella radiculata* (Sow. ex Fr.) Nannf., Svensk bot. Tidskr. (xxxii, 118). On the ground.
- Pustularia bolarioides** Ramsb. ex Bagchee in 33 (xxxix, 218, April 1925); 28 (x, 1) = *P. rosea* Rea q.v. Associated with *Epilobium angustifolium*, Oxshott, Farnham, Stoke Common, Mitcham, etc.
- **catinus** (Holmsk. ex Fr.) Fuckel 28 (iv, 366); Buller (Researches, vi, 332, 'puffing'); 115 (15); 27 (lx, 174); Boudier, Icones, pl. 336†; 41 (pl. 75, fig. 290†); *Peziza*—Svensk bot. Tidskr. (xxxii, 108, for structure and affinities); as *Aleuria albid*a—35 (7, 1900); 28 (i, 151). In a ware-house yard.
- **cupularis** (Linn. ex Fr.) Fuckel 28 (iv, 366); 115 (15); Boudier, Icones, pl. 338†; *Geophyxis*—115 (15); Ramsbottom, Handbk., 186; 8 (iv, 382); *Peziza*—27 (xvii, 363); 11 (47*); 40 (iv, n.s., 131); 70 (i, n.s., 298); 13 (304); 41 (pl. 74, fig. 286†); 15 (673); 18 (365); 19 (xiii, No. 308); 20 (189); 38 (Ed. 2, iii, 437); Hudson, Fl. Anglica (635, 1778). Exs.: 43 (No. 155). On the ground in damp places, spring and autumn.
- **Gaillardiana** Boud. 28 (xiii, 257, 1928); 117 (xviii, 141†); Boudier, Icones, pl. 339†. On bare soil, Symond's Yat, Gloucester.
- **lecinthina** (Cooke) Rea 28 (vii, 58); *Peziza*—41 (pl. 23, fig. 89*); Cooke in 14 (iv, 110, 1876); 11 (96); *Helotium*—8 (iv, 233*); 28 (iv, 368). On old tree trunks.
- **ochracea** Boud. 28 (iv, 366); 115 (15); Boudier, Icones, pl. 337†; *Peziza*—Ramsbottom, Handbk., 188; 8 (iv, 434); 11 (62); 41 (pl. 105, fig. 377†, 1879). On the ground, frequently under ash and beech.
- **patavina** (Cooke & Sacc.) Boud. 28 (iv, 194, 1913; iv, 366); Trans. Perthsh. Soc. nat. Sci. (vii, 5); 41 (pl. 100, fig. 360†, as *P. 'pataviana'*). Amongst moss on an old charcoal bed, Perthshire.
- **rosea** Rea in 108 (viii, 20, 1924; viii, Appendix, 112). = *P. bolarioides* q.v. On earth, near *Epilobium angustifolium*, Virginia Water, Wyre Forest.
- **scotica** Rea in 28 (xiii, 258, 1928). On clay soil, near Perth.
- Rhizina inflata** [Schaeff.] Qué. 28 (iv, 364); Buller, (Researches, vi, 341, spore discharge); 108 (viii, Appendix, 317); Boudier, Icones, pl. 251†; 115 (14); 7 (251); 112 (151); 8 (iv, 453*); 93 (235); 23 (xviii, 816); 94 (iv, 308); *Rhizina undulata*—Ramsbottom, Handbk., 185; Bot. Gaz. (lxv, 201, sexuality); 56 (xiv, 146); 40 (iv, n.s., 130); 11 (40*); 15 (664*); 19 (xv, No. 1076); 45 (xxiv, 493); 38 (Ed. 2, iii, 437); 111 (pl. 105, fig. 2*, 1789). Exs.: 43 (No. 56); Cooke, 'Fung. Brit.', Ed. 2, No. 400. Saprophytic in woodland soils and where recently burned; it can also be parasitic on young conifers.
- **laevigata** Fr. 28 (iv, 365); 115 (14); Ramsbottom, Handbk., 185; 11 (41); 40 (iv, n.s., 131); 14 (ii, 162*, 1874); *Rhizina inflata* var. *rhizophora*—8 (iv, 454); *Octospora rhizophora*—Hedwig, Laub-Moose (ii, pl. v, fig. A†). On the ground and on stumps.
- Sarcoscypha coccinea** (Jacq. ex Fr.) Cooke 28 (iv, 366); 115 (16); Ramsbottom, Handbk., 188; 106 (xxvii, 248); Buller (Researches, vi, 331, spore discharge); Boudier, Icones, pl. 322†; 7 (252); 102 (iv, 197, anatomy); 117 (xx, 138†, conidial form; xlvi, 109, cytology; xlvii, 50); *Geophyxis*—115 (15); 27 (lxii, 148, audible spore discharge); 8 (iv, 377); *Lachnea*—11 (203); 40 (iv, n.s., 175); *Peziza*—27 (xvii, 363); 41 (pl. 25, fig. 95*); Glasg. Nat. (i, 97); 65 (xii, 277); 15 (679); 18

- (367); **20** (192); **58** (152); **39** (III, 171); **51** (421); **55** (683); **111** (III, pl. 104*); **38** (Ed. 1, II, 776; Ed. 2, III, 438); *Macroscyphus*—**120** (I, 672); *Geophyxis Bloxami* Mass. —**14** (XXII, 98); **8** (IV, 384); *Peziza epidendra*—**55** (686); **42** (pl. 13*); *Peziza cyathoides* —**95** (Ed. 2, 1052); Relhan, Fl. Cantab., 465; Hudson, Fl. Anglica (Ed. 1, 499, 1762; Ed. 2, 636; Ed. 3, 636); *Peziza lutea parva*—Ray, Syn. (Ed. 3, No. 8, 18, 1724). On rotting twigs, etc.
- Sarcoscypha coccinea** var. **albida** Mass. **28** (IV, 366); **115** (15); **7** (252); **35** (1900, 7); Massee in **8** (IV, 378); **11** (204); **60** (XXI, 67, 1885); J. Nannfeldt, Svensk bot. Tidskr. XLIII, 477, mentions a white form, *f. albida* Klinge, found in Sweden. On soil.
- **coccinea** var. **jurana** Boud. **35** (203, 1936); **117** (XIX, 194; LVII, 50); Boudier, Icones, pl. 323†; Le Gal regards this variety as of no taxonomic value. On moss covered branches, Mulgrave Woods, Yorkshire.
- **protracta** (Fr.) Sacc. **28** (IV, 366); Trans. Perthsh. Soc. nat. Sci. (VII, 149); **40** (1910, 186); Buller (Researches, VI, 236–63, spore dispersal and perennial pseudorhiza); *Lachnea*—**40** (V, n.s., 34); *Anthopeziza mirabilis*—**8** (IV, 388); *Lachnea mirabilis*—**14** (XVIII, 83, 1890); **40** (IV, n.s. 1890, 384); *Peziza mirabilis*—**41** (pl. 25, fig. 98†); *Anthopeziza protracta* (Fr.) Nannf. in Svensk bot. Tidskr. XLIII, 477; *Plectania hiemalis*—Seaver, N. Amer. Cup Fungi, 193. Among pine needles and grass.
- Sarcosphaera coronaria** (Jacq. ex Cooke) Boud. **28** (IV, 365; XX, 1); Rev. mycol. (III, n.s., Mem. No. 1, affinities with Tuberales); **108** (VIII, Appendix, 316); **115** (14); Boudier, Icones, pl. 302†; **100** (XXXIII, 579†); **105** (LXIII, 55, critical notes); *Sepultaria*—**8** (IV, 392); *Peziza*—**117** (XXVIII, 157, indigestible); **11** (68); **41** (pl. 61, fig. 238†); as *Peziza macracalyx*—**27** (VII, 345*, 1869); **15** (670); **19** (VIII, No. 1320, with fig.). Among moss on the ground in spring.
- Sepultaria arenicola** (Lév.) Mass. **28** (IV, 366; VI, 145); **8** (IV, 390); **27** (I, 190); *Lachnea*—**11** (210); *Peziza*—**41** (pl. 30, fig. 118†); **14** (III, fig. 210); Seaver (1928, 149) regards this and *S. Sepulta* as synonymous. On sandy ground.
- **arenicola** var. **Bloxami** Cooke in **41** (pl. 31, fig. 121*, 1876); **28** (IV, 366); *Lachnea arenicola* var. *Bloxami*—**11** (211); as *S. arenicola*—**8** (IV, 390). In sandy places.
- **foliacea** (Schaeff. ex Boud.) Boud. **28** (IV, 195, 1913; IV, 366); Trans. Perthsh. Soc. nat. Sci. (VII, 6); Boudier, Icones, pl. 359†. According to Boudier in Hist. et Class. Disc. d'Europe, 1907, 59, this is *Peziza lanuginosa* Bull. On sandy clay soil in Old Red Sandstone quarry, Perth.
- **geaster** (B. & Br.) Boud. **28** (IV, 366); *Lachnea*—**11** (210); **54** (IV, 731); *Peziza*—**36** (XXXI, 490); **41** (pl. 29, fig. 114*); **15** (681); **19** (XVIII, No. 1162, with fig.; VII, No. 956, 1861); as *Sepultaria sepulta*—**8** (IV, 389). On the ground.
- **sepulta** (Fr.) Mass. **28** (IV, 366; VI, 145 & 366); **8** (IV, 389); **106** (XXVII, 27); *Lachnea*—**11** (209); *Peziza*—**41** (pl. 29, fig. 112†); **15** (681); **14** (IV, 120); **18** (365); **19** (XIII, No. 766, 1854); = *Sepultaria arenicola*—Seaver (1928, 149). On the ground usually under cedar.
- **Sumneri** (Berk.) Boud. **28** (IV, 366); **108** (VIII, Appendix, 316); Boudier, Icones, pl. 358†; *Peziza*—**56** (I, XLIV); *Peziza lanuginosa* var. *Sumneri*—**15** (680); **19** (XVIII, No. 1161, with fig.); **45** (XXV, 432*, 1866); as *Peziza lanuginosa*—**65** (XII, 277); *Sepultaria Sumneriana* Cooke—**8** (IV, 391); **11** (213); **41** (178, pl. 80, fig. 310†); *Peziza Sumneria*—**27** (XXII, 151). Seaver (1928, 150) regards this as a synonym of *S. arenicola*. Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 471; **43** (No. 62). On the ground under cedars, larch, etc.
- **tenuis** (Fuckel) Cooke **28** (IV, 316, 1914; IV, 366); Boudier, Icones, pl. 362†; **41** (pl. 30, fig. 116†). Amongst moss in a beech wood, nr. Cambridge.
- Tricharia cretea** (Cooke) Boud. **28** (IV, 366); **115** (16); *Lachnea*—**8** (IV, 321); **40** (IV, n.s., 177); **11** (228); **33** (XXVII, 553; XLI, 489, ascocarp development and germination respectively); *Peziza*—**13** (311); **41** (pl. 100, fig. 362*); **14** (VI, 75*); Cooke in **65** (XIII, 46*, 1879). On damp plaster walls and ceilings.
- fimbriata** (Quél.) Boud. **28** (IV, 366); Boudier, Icones, pl. 348†; **115** (16); **27** (I, 190); *Peziza*—**41** (pl. 113, fig. 405†); *Lachnea*—**7** (264); **35** (VII, 110, 1903); Halifax Nat., VII, 109, 1903. On dust near cellar window; on soil and rotten wood of fern box.
- **gilva** Boud. **28** (IV, 195 & 366); **115** (16); **41** (pl. 113, fig. 406†); Boudier, Icones, pl. 347†; *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 166; *Lachnea*—**7A** (306);

35 (8, 1906); 28 (II, 168). On sandy soil at river side, Hebden Bridge, Yorks and excavated clay soil by roadsides, near Perth.

Tricharia livida (Schum. ex Fr.) Boud. 28 (IV, 366); as *Lachnea*—8 (IV, 322); 40 (IV, n.s., 176); 11 (221); *Peziza*—14 (III, fig. 222*); 13 (310); 15 (683); 41 (pl. 41, fig. 139*); 18 (368); 19 (VII, No. 558, 1851). On chips of wood.

Urnula melastoma (Sow. ex Fr.) Boud. 28 (IV, 366); Boudier, Icones, pl. 342†; *Plectania*—8 (IV, 302*); *Rhizopodella*—Svensk bot. Tidskr. XLIII, 481; *Lachnea*—40 (IV, n.s., 175); 11 (216*); *Peziza*—Ramsbottom, Handbk., 189; 41 (pl. 27, fig. 103†); 15 (679); 14 (IV, 120); 18 (367); 20 (192); Sowerby in 42 (pl. 149*, 1798); *Calycina*—120 (I, 670); *Peziza atro-rufa*—39 (VI, pl. 315*). On sticks lying on the ground.

Wynella auricula (Schaeff. ex Cooke) Boud. 28 (IV, 365); 115 (15); Boudier, Icones, pl. 250†; *Otidea*—8 (IV, 442); 14 (XXII, 65); *Peziza*—11 (54); 41 (pl. 54, fig. 213*); 14 (V, 60); 38 (Ed. 3, IV, 351); 111 (III, pl. 107); Relhan, Fl. Cantab. (466, 1785); as *Otidea neglecta*—14 (XXII, 66); 8 (IV, 440); as *Peziza cochleata*—Hudson, Fl. Anglica (637, 1778). On the ground.

HUMARIACEAE

Anthrocobia macrocystis (Cooke) Boud. 28 (IV, 367); 115 (17); *Humaria*—Glasg. Nat. (VIII, 55); 8 (IV, 411); *Peziza*—11 (91); 40 (IV, n.s., 134); 13 (307); 41 (pl. 16, fig. 63*); *Peziza subhirsuta* var. *macrocystis* Cooke in 14 (I, 129, 1873). Exs.: 43 (No. 59). On burnt ground.

— **maurilabra** (Cooke) Boud. 28 (IV, 368); 115 (17); 108 (VIII, Appendix, 313); Boudier, Icones, pl. 389†; *Humaria*—115 (17); 8 (IV, 415); *Peziza*—11 (94); 40 (IV, n.s., 134); 41 (pl. 109, fig. 388*); 13 (317); Cooke in 14 (IV, 64, 1877). On the ground, on chips and on charcoal.

— **melaloma** (Alb. & Schw. ex Fr.) Boud. 28 (IV, 367); 108 (VIII, Appendix, 313); Boudier, Icones, pl. 387†; *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 167†; *Humaria*—115 (17); 8 (IV, 411); *Lachnea*—33 (n.s., I, 99, life history); *Peziza*—40 (IV, n.s., 135; VI, n.s., 33); 11 (109); 41 (pl. 17, fig. 67†); 15 (674); 109 (1873, 113); 18 (366); 19 (I, No. 88); 20 (190, 1836). On the ground, especially where burnt.

— **nitida** Boud. 28 (IV, 196, 1913; IV, 368); Trans. Perthsh. Soc. nat. Sci. (VII, 8); Boudier, Icones, pl. 388†. On charcoal heaps, Kinfauns, Perthshire.

Cheilymenia ascoboloides (Bert.) Boud. in litt. 28 (IV, 367); 115 (17); *Lachnea*—7 (263); 8 (IV, 314); *Peziza*—11 (96); 41 (pl. 98, fig. 352†); *Peziza ectlecta*—19 (III, No. 1827*); 14 (V, 60, 1876). On the ground and on dung of various kinds.

— **cinnabarina** (Schw.) Rea 28 (V, 440); *Lachnea*—28 (II, 168; IV, 366); 115 (16); 35 (1906, 8). On dry mud settlements of old dye tanks, Hebden Bridge, Yorks.

— **coprinaria** (Cooke) Boud. 28 (IV, 367); 115 (17); Boudier, Icones, pl. 383†; *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 171; *Lachnea*—115 (16); 7 (262); 102 (IV, 212, anatomy); 8 (310); 11 (224); 40 (IV, n.s., 176); *Peziza*—13 (311); 41 (pl. 38, fig. 149*); 40 (III, 200); 19 (I, No. 1722); Cooke in 14 (IV, 91, 1875). On cow dung.

— **coprinaria** var. **minima** Grove 28 (IV, 367, in a footnote Rea says this is identical with the type); *Lachnea*—Grove in 27 (I, 47, 1912; XVI, 286, said by Grove to be growth stage of *Ascobolus barbatus*); 28 (IV, 168; VI, 152). On rabbit dung.

— **dalmeniensis** (Cooke) Boud. 28 (IV, 367; IX, 5; XII, 79); 115 (17); *Lachnea*—115 (16); 7 (264); 8 (317); 11 (227); 40 (IV, n.s., 177); *Peziza*—27 (XXIII, 134); 13 (311); 41 (pl. 39, fig. 153*); Cooke in 14 (III, 66*, 1874); Midl. Nat. (VI, 163). On the ground in woods.

— **erecta** (Sow. ex Fr.) Boud. 28 (IV, 367); *Lachnea*—11 (266); *Peziza*—15 (674); 18 (366); 20 (194); Sowerby in 42 (pl. 369, fig. 10* & 11*, 1802); 'Excluded' by Massee—8 (IV, 323). On shaded ground, wet moss.

— **luteopallens** (Nyl.) Boud. 28 (IV, 367); 115 (17); *Peziza*—41 (pl. 40, fig. 156†); as *Lachnea Lojkaeana*—7 (264), 28 (I, 196); 35 (183, 1901); Halifax Nat. v, 120, 1901. On soil adhering to tub in dye-house yard, Hebden Bridge, Yorks.

— **rubra** (Cooke) Boud. 28 (IV, 367); 115 (17); *Lachnea*—8 (IV, 313); 11 (225); 40 (IV, n.s., 176); *Peziza*—41 (p. 83, pl. 39, fig. 152*, 1876); 14 (III, fig. 119*). Exs.: *Peziza theleboloides* Alb. & Schw. var. *rubra*—Cooke, 'Fung. Brit.', Ser. I, No. 572. On spent hops, rotten leaves, etc.

- Cheilymenia stercorea** (Pers. ex Fr.) Boud. 28 (iv, 367); 115 (17); Boudier, Icones, pl. 384†; *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 169; *Lachnea*—4 (262); 33 (xxi, 349, sexuality and development; xxiii, 537, cytology; xlvii, 382, comparison with *Lachnea scutellata*); 8 (iv, 311); 11 (223); 40 (iv, n.s., 176); *Peziza*—70 (i, n.s., 298); 41 (pl. 38, fig. 147*); 13 (310); 15 (683); 18 (368); 20 (194); 120 (i, 665); as *Peziza equina*—42 (pl. 352*); as *Peziza scutellata*—38 (Ed. 2, iii, 442); 111 (pl. 108, fig. 1*, 1789); as *Octospora scutellata*—Hedwig, Laub-Moose (ii, pl. III, fig. A†). Has at times been confused with *Ciliaria scutellata* (Linn. ex Fr.) Quél. q.v. On rich soil and on dung of cow, horse, rabbit, etc.
- **subhirsuta** (Schum. ex Fr.) Boud. 28 (iv, 367); 115 (17); Boudier, Icones, pl. 381†; *Humaria*—115 (17); 8 (iv, 416); *Peziza*—11 (108); 40 (iv, n.s., 135); 106 (ii, 190); 15 (675); 41 (pl. 17, fig. 66†); 13 (305); 19 (xviii, No. 1156, 1866, with fig.). Boudier in Hist. et Class. Disc. d'Europe, 1907, 62, suggests this may be a well-developed form of *C. theleboloides*. On the ground.
- **theleboloides** (Alb. & Schw. ex Fr.) Boud. 28 (iv, 367); 115 (17); Boudier, Icones, pl. 380†; 62 (xviii, 347); *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 170; *Lachnea*—102 (iv, 210, anatomy); 8 (iv, 317); 11 (225); 40 (iv, n.s., 176); *Peziza*—41 (pl. 39, fig. 151*); 15 (683); 19 (xv, No. 1065, with fig.); 45 (xxiv, 153, 1863). On spent hops, decaying vegetable matter, and on paper-mill lime waste dump.
- Ciliaria asporior** (Nyl.) Boud. 28 (iv, 367); Rev. mycol. (ii, n.s., 215†); 115 (17); 108 (viii, Appendix, 316); Boudier, Icones, pl. 378†; *Sphaerospora*—8 (iv, 293); *Peziza*—11 (85); 41 (pl. 13, fig. 51†); 27 (xxiii, 133); 14 (iii, 186*, 1875). On damp earth, gravel, moss-covered charcoal.
- **binominata** (Mass.) Boud. 28 (iv, 367); *Sphaerospora*—Massee in 8 (iv, 293, 1895). Growing on a patch of *Jungermannia turbinata*, Ireland.
- **brunnea** (Alb. & Schw. ex Fr.) Boud. 28 (iv, 367); *Peziza*—13 (309); 15 (681); 14 (iv, 125); 18 (367); 19 (xiii, No. 309*); *Sphaerospora*—8 (iv, 295). On the ground and on charcoal beds.
- **carneo-sanguinea** (Fuckel) Boud. 28 (iv, 367); 115 (16); *Lachnea*—7 (262); 8 (iv, 309); 11 (222, 1887); 14 (iii, fig. 107†). On the ground and on tan-yard refuse.
- **caudata** Buckley 28 (ix, 45, 1923). On the ground, among moss, Argyllshire.
- **citrina** (Mass. & Crossl.) Boud. 28 (ii, 94; iv, 367); *Sphaerospora*—7 (266); Massee & Crossland in 35 (4, 1904). On peaty ground, Redcar.
- **confusa** (Cooke) Boud. 28 (iv, 367); Rev. mycol. (ii, n.s., 215†); 106 (xxvii, 27); Boudier, Icones, pl. 379†; 115 (17); *Sphaerospora*—8 (iv, 296); *Peziza*—41 (pl. 32, fig. 124†); *Lachnea*—Cooke in 14 (xviii, 83, 1890). On burnt soil.
- **contorta** (Mass. & Crossl.) Boud. 28 (iv, 367); 115 (16); *Lachnea*—Massee & Crossland in 35 (June 1901, 182*); 7 (262); 28 (i, 196). On naked ground.
- **crucipila** (Cooke & Phill.) Boud. 28 (iv, 367); 115 (16); *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 168; *Lachnea*—7 (263); 8 (iv, 311); 106 (xi, 314); 11 (229); *Peziza*—41 (pl. 60, fig. 237*); Cooke & Phillips in 14 (v, 61, 1876). On the ground, in damp places and on cow and horse dung.
- **hinnulea** (B. & Br.) Boud. 28 (iv, 367); 115 (17); *Sphaerospora*—7 (266); 8 (iv, 294); *Lachnea*—11 (219); *Lachnella*—46 (vi, n.s., 193); *Peziza*—41 (pl. 13, fig. 52*); 14 (ii, 129); Berkeley & Broome in 19 (vii, No. 1320*, 1871). On the ground amongst moss and where burnt.
- **hirta** (Schum. ex Fr.) Boud. 28 (iv, 367); Rev. mycol. (vii, n.s., 4); 115 (16); Boudier, Icones, pl. 371†; *Lachnea*—115 (16); 8 (iv, 314); 11 (220); 40 (iv, n.s., 176); *Peziza*—15 (681); 41 (pl. 33, fig. 128*); 14 (iii, 125); 18 (367); 19 (vii, No. 557, 1851). On the ground, on wood, old Polypori, etc.
- **hirto-coccinea** (Phill. & Plowr.) Boud. 28 (iv, 367); 115 (16); *Lachnea*—8 (iv, 309); 115 (16); 35 (1907, 404); 11 (212); 40 (iv, n.s., 175); *Peziza*—40 (vi, 123); Phillips & Plowright in 14 (viii, 100, 1880). On the ground amongst moss; on wet sand and on rotten wood.
- **lapidaria** (Cooke) Boud. 28 (iv, 367); 115 (16); *Lachnea*—11 (211); 46 (iv, n.s., 194); *Peziza*—46 (vi, n.s., 28); as *Peziza hybrida*—Cooke in 14 (xii, 43, 1883); *Lachnea hybrida* var. *lapidaria*—7 (263); 48 (vii, 289); 8 (iv, 313). Growing between stones.
- **Phillipsii** (Mass.) Boud. in litt. 28 (iv, 367); 115 (17); *Sphaerospora*—8 (iv, 295); as *Lachnea brunnea* (Alb. & Schw.) Phill.—11 (209, 1887). On the ground.

- Ciliaria schizospora** (Phill. in litt.) Boud. 28 (iv, 367); *Barlaea*—8 (iv, 399); *Peziza*—11 (87); 41 (pl. 20, fig. 80*); 14 (I, 129, 1873). On burnt or sandy soil.
- **scutellata** (Linn. ex Fr.) Quél. 28 (iv, 367); Rev. mycol. (II, n.s., 219†; VII, n.s., 3); 115 (16); Buller, (Researches, VI, 278–85, heliotropism of asci); 108 (VIII, Appendix, 316); Boudier, Icones, pl. 368†; *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 159†; *Lachnea*—115 (16); 113 (1931, 24); 27 (L, 190); 7 (263); 33 (XIII, 480, 507; XLVII, 375, development of asci); Bot. Gaz. (LII, 275†, development of apothecia); 102 (iv, 206, anatomy); 8 (iv, 315*); 40 (iv, n.s., 176); 11 (222); *Peziza*—27 (XVII, 363); 15 (682); 70 (I, n.s., 298); 18 (368); 20 (193); 58 (148); 51 (420); 92 (II, 33); 120 (I, 665); 55 (686); 42 (pl. 24*); 95 (Ed. I, II, 1053); Relhan, Fl. Cantab. 466, No. 969; Hudson, Fl. Anglica (Ed. I, 500, 1762; Ed. 2, 637; Ed. 3, 637); as *Ocotospora hirta*—Hedwig, Laub-Moose (II, pl. III, fig. B†); as *Lachnea hirta-coccinea*—35 (1894, 170); *Peziza acetabuliformis coccinea marginibus pilosis*—Ray's Syn. Ed. 3, no. 14, p. 19, 1724. Some of the older references apparently refer to mixed gatherings of this and *Cheilymenia stercorea* (Pers. ex Fr.) Boud., e.g. Hudson, Ed. I, refers to *C. scutellata*, while the later editions include both species under this name. On rotten wood, sacking and soil near stumps.
- **setosa** (Nees.) Boud. 28 (iv, 367); 106 (XXVII, 27); 115 (16); Boudier, Icones, pl. 370†; *Lachnea*—8 (iv, 312); 11 (406, 1887); *Peziza*—41 (pl. 34, fig. 133†). On rotten trunks.
- **trechispora** (B. & Br.) Boud. 28 (iv, 367; XI, 5); 115 (17); 108 (VIII, Appendix, 316); Boudier, Icones, pl. 375†; *Lachnea*—102 (iv, 208, anatomy and structure); 11 (218*); 40 (iv, n.s., 176); *Sphaerospora*—27 (L, 190); 7 (266, ? = *Ciliaria trechispora*); 8 (iv, 292); *Peziza*—36 (XXXI, 513*); 41 (pl. 33, fig. 129*); 15 (682); 13 (309); 18 (368); Berkeley & Broome in Ann. Mag. nat. Hist. (XVIII, 77, 1846). On the ground in woods, and on charcoal covered with moss.
- **trechispora** var. **paludicola** Boud. 28 (iv, 367; VI, 145); 27 (L, 190); Lancs. Nat. (III, 83, 1910); *Sphaerospora trechispora* var. *paludicola*—28 (III, 281). Among moss in sand flats, nr. Formby.
- **umbrata** (Fr.) Quél. 28 (iv, 367); Boudier, Icones, pl. 372†; 115 (16); *Lachnea*—7 (262); 8 (iv, 309); 11 (222); *Peziza*—27 (XVII, 363); 41 (pl. 35, fig. 137†); ? *Peziza umbrosa* p.p. 19 (XVIII, No. 1163, 1866, with fig.). On the ground and among moss.
- **umbrata** var. **pallida** Rehm 28 (iv, 367); 14 (XVII, 45, 1888). On earth in damp places.
- **umbrorum** (Fr.) Boud. 28 (iv, 367); 115 (16); Boudier, Icones, pl. 369†; 62 (XVIII, 346); *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 161; *Lachnea*—7 (263); 8 (iv, 316); 40 (iv, n.s., 176); 11 (219); *Peziza*—41 (pl. 35, fig. 138*); *Peziza umbrosa* p.p.—19 (XVIII, No. 1163, 1866, with fig.). On damp ground, on paper-mill lime waste dump, and on road scrapings and tan refuse.
- **vitellina** (Pers. ex Fr.) Boud. 28 (iv, 367); 115 (17); *Lachnea*—7 (264); 8 (iv, 316); 11 (220); 40 (iv, n.s., 176); *Peziza*—15 (682); 41 (pl. 37, fig. 143*); 13 (310); 19 (XVIII, No. 1163*, with fig.); 18 (368); 20 (193, 1836). On the ground.
- Coprobria granulata** (Bull. ex Fr.) Boud. 28 (iv, 368; XIV, 264, morphology); 115 (18); *Humaria*—33 (XXIII, 537, cytology; XLIV, 127, life history); 27 (I, 190); 8 (iv, 414); 67 (LXXVIII, 354, development); *Peziza*—27 (XVII, 363); 11 (94); 40 (iv, n.s., 134); 70 (I, n.s., 298); 15 (677); 41 (pl. 15, fig. 59*); 20 (190); *Peziza fulva*—Hudson, Fl. Anglica (Ed. 2, 636, 1778). On cow and horse dung.
- Desmazierella acicola** Lib. 28 (iv, 367); 115 (16); 7 (266); Boudier, Icones, pl. 363†; 8 (iv, 325); 11 (283); 40 (III, n.s., 173; IV, n.s., 182); 19 (I₅, No. 1720); 14 (III, 126, 1875). On dead leaves of *Pinus sylvestris*.
- Humaria aggregata** (B. & Br.) Sacc. 28 (iv, 368); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 136; *Peziza*—15 (675); Berkeley and Broome in 19 (XVIII, No. 1155, 1866); *Humaria carbonigena* var. *aggregata*—8 (iv, 410); *Peziza fusispora* var. *aggregata*—11 (104); 40 (iv, n.s., 135); 13 (305). On heathy ground.
- **carbonigena** (Phill.) Sacc. 28 (iv, 368); 115 (17); 8 (iv, 409); *Peziza*—11 (103, 1887); 41 (pl. 8, fig. 29†); 36 (XXXI, 499). On burnt ground and charcoal beds.
- **carneola** (Saut.) Sacc. 28 (I, 196; IV, 368); 35 (1901, 187); 40 (1901, 189); 73 (VII, Ser. 2, 372*, 1900). On *Tetraplodon mnioides*.
- **coccinea** (Cr.) Quél. 28 (iv, 368); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928,

- 137; *Peziza corallina*—41 (pl. 8, fig. 30*, 1875); 11 (102*); 14 (III, fig. 83†); *Neotiella corallina*—8 (IV, 372). On the ground, amongst heather and moss.
- Humaria convexula*** (Pers. ex Fr.) Quél. 28 (IV, 368); 115 (17); 7 (259); 27 (L, 190); 8 (IV, 408); *Peziza*—11 (95); 40 (IV, n.s., 134); 13 (307); 41 (p. 22, pl. 9, fig. 36†, 1875). On bare soil.
- ***fusispora*** (Berk.) Sacc. 28 (IV, 368); 108 (VIII, Appendix, 317); Boudier, *Icones*, pl. 394†; 115 (17); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 136; *Peziza*—41 (pl. 8, fig. 32*); 11 (103); 40 (III, n.s., 135); 19 (xv₄, No. 1481); Berkeley in 21 (p. 5, 1846); *Humaria carbonigena* var. *fusispora*—8 (IV, 410). Among heather and on turfy ground.
- ***fusispora*** var. *scotica* Rabenh. 11 (104); 40 (IV, n.s., 135); 13 (305, 1879); 8 (IV, 410, as *H. carbonigena* var.). On heath and turfy ground.
- ***haemastigma*** (Cooke) Mass. 28 (IV, 368); 115 (17); 8 (IV, 405); *Peziza*—11 (107); 15 (677); Cooke in 41 (p. 39, pl. 18, fig. 70*); 19 (xviii₃, No. 1159, 1866, with fig.); *Octospora*—Hedwig, Laub-Moose (II, pl. V, fig. B†); *Pulvinula*—108 (VIII, Appendix, 113). White-washed walls and on mortar.
- ***humosa*** (Fr.) Sacc. 28 (IV, 368); Boudier, *Icones*, pl. 391†; 8 (IV, 405); *Peziza*—27 (xvii, 363); 11 (92); 40 (IV, n.s., 134); 41 (pl. 7, fig. 25*); 15 (676); 18 (366); 19 (xviii₃, No. 1156*, with fig.); 20 (191); *Peziza cartilaginea*—58 (148); 42 (pl. 369, fig. 2*); *Helvella cartilaginea*—38 (Ed. 2, III, 431); 111 (III, pl. 101, fig. 1*, 1789). On the ground.
- ***leucoloma*** (Hedw. ex Fr.) Sacc. 28 (IV, 368); Boudier, *Icones*, pl. 395†; 115 (17); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 129; *Neotiella*—7 (265); 8 (IV, 374); *Peziza*—11 (91); 40 (IV, n.s., 134); 41 (pl. 7, fig. 28†); 18 (366); 65 (xii, 275); 15 (675); 19 (xviii₃, No. 1156*, with fig.); 20 (191); *Octospora*—120 (I, 667, 1821); Hedwig, Laub-Moose (II, pl. IV, fig. A†). On the ground, among moss.
- ***myrothecioides*** (B. & Br.) Boud. 28 (IV, 368); *Pulvinula*—115 (18); *Rhizina*—7 (251); 8 (IV, 455); *Psilopezia*—11 (111); 40 (IV, n.s., 125); 13 (333); 19 (xv₄, No. 1489, 1875, with fig.). Boudier in Hist. et Class. Disc. d'Europe, 1907, treats it as a doubtful member of *Humariaceae*. On wood of *Prunus Padus* and *Ulex europaeus*.
- ***Nicholsonii*** Mass. 28 (I, 196; IV, 368); 115 (17); 37 (Addnl. Series, v, 153, 1906); Massee in 35 (188*, 1901). On dead beech leaves.
- ***oocardii*** (Kalch.) Sacc. 115 (17); 35 (1901, 188); 8 (IV, 422); *Peziza*—41 (pl. 12, fig. 47†); 11 (98); 14 (xiii, 73, 1885); *Rhizina*—7 (251); *Pulvinaria Velenovsky*, 332; *Peltidium*—40 (I, n.s., 86, 1883); *Peziza oocardii* var. *liquaria*—11 (99); 8 (IV, 422). Boudier in Hist. et Class. Disc. d'Europe, 1907, suggests this may be identical with *Pachyella depressa* (Phill.) Boud. q.v. On stones and wood, pine, birch, etc., in wet places.
- ***pilifera*** (Cooke) Sacc. 28 (IV, 368); 115 (17); 8 (IV, 408); *Peziza*—11 (93, 1887); 41 (pl. 23, fig. 92†). On the ground.
- ***Roumegueri*** (Karst.) Sacc. 28 (I, 71; IV, 368); 115 (17); 35 (104, 1898; 1901, 188); *Peziza*—40 (VI, 122, 1881). On peaty ground in old quarry, near Harrogate.
- ***Roumegueri*** var. *carnosissima* Phill. 28 (IV, 368); 115 (17); 35 (1903, 50); 8 (IV, 414); *Peziza*—11 (104); Phillips in 14 (x, 67, 1881); 40 (VI, 123, 1881). Exs.: 43 (No. 158, 1881). On decaying vegetable matter and on moorland.
- ***rubens*** Boud. 28 (I, 116; IV, 196 & 368); 115 (17); Boudier, *Icones*, pl. 396†; 117 (xii, 13; xxxv, xvi); 7 (258); 35 (Jan. 1899, 27); Halifax Nat. (I, 98, 1897); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 127. Among moss.
- ***semi-immersa*** (Karst.) Sacc. 28 (IV, 368); 115 (17); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 130; *Sepultaria*—8 (IV, 391); *Peziza*—11 (95); 41 (pl. 12, fig. 46†); 14 (IV, 120, 1876). Exs.: 43 (No. 60). On damp earth.
- ***tetraspora*** (Fueckl) Boud. 28 (VI, 63*, 1918); Trans. Perthsh. Soc. nat. Sci. (VII, 9); Boudier, *Icones*, pl. 393†; *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 134; *Peziza*—41 (pl. 12, fig. 45†). Amongst moss and on a sandy bank, and on charcoal heap.
- ***Wrightii*** (Berk. & Curtis) Boud. 28 (IV, 368); Rev. mycol. (VII, n.s., 84†, structure of ascus pore); Boudier, *Icones*, pl. 399†; *Barlaea*—8 (IV, 395); *Peziza*—11 (86); 41 (pl. 5, fig. 18*); Berkeley & Curtis in 19 (xv₃, No. 1064, 1865, with fig.). Among moss on trunks of trees.
- Lamprospora astroidea*** (Hazsl.) Boud. 28 (IV, 368); 115 (18); *Peziza*—41 (pl. 13, fig. 49†); *Barlaea*—7 (258, 1905); 8 (IV, 397). On the ground among moss.

- Lamprospora campylopodis** Buckley 28 (ix, 44, 1923). On the ground among moss at base of pine, Argyllshire.
- **carbonicola** Boud. 28 (xiii, 258, 1928); 108 (viii, Appendix, 317); Boudier, Icones, pl. 401†. Amongst moss on burnt ground, Salop.
- **Crec'hqueraultii** (Cr.) Boud. 28 (iv, 321 & 368); 108 (viii, Appendix, 317); Boudier, Icones, pl. 404†; *Peziza auriflava* Cooke—41 (p. 16, pl. 6, fig. 23†); 14 (xviii, 88, 1890); Nannfeldt, 1932, 60—*Sphaerospora perplexa* Seaver (1928, 45) is probably the same species. On soil.
- **dictydiola** Boud. 28 (ix, 46, 1923); Boudier, Icones, pl. 403†. On burnt ground amongst moss, Bucks.
- **miniata** (Cr.) De Not. 28 (iv, 368); Rev. mycol. (iii, 116); 115 (18); 108 (viii, Appendix, 317); Boudier, Icones, pl. 402†; *Ascobolus*—45 (xxiv, 495); *Barlaea Crouani*—7 (257); 8 (iv, 395, p.p.); as *Peziza Crouani*—11 (84*); 40 (iv, n.s., 133); 41 (pl. 5, fig. 17*); as *Ascobolus Crouani*—15 (726); 19 (xv, No. 1085, with fig.); 27 (ii, 151*, 1864). On earth amongst moss.
- **modesta** (Karst.) Boud. 28 (i, 116; iv, 368); 115 (18); *Barlaea*—7 (257); 35 (27, 1899; 1901, 187); *Peziza*—41 (pl. 9, fig. 33†). On sandy soil on bank of stream.
- Melastiza Chateri** (W. G. Sm.) Boud. 28 (iv, 367); 115 (17); *Humaria*—115 (17); 35 (1914, 98); 8 (iv, 404); *Peziza*—102 (xv, 356, critical notes); 11 (89); 41 (pl. 16, fig. 62*); 14 (i, 120; iii, fig. 68†); 19 (xi, No. 1390); W. G. Smith in 31 (1872, p. 9*); 27 (x, 31; x, 86*). Exs.: 43 (No. 58). Said to be young stage of *Melastiza miniata*—28 (iv, 367); Boud. Icon. text p. 218. On the ground.
- **miniata** (Fuckel) Boud. 28 (iv, 367); Buller (Researches, vi, 285, heliotropism); Rev. mycol. (iii, 116, protoplasmic structure), Boudier, Icones, pl. 386†; 115 (17); *Peziza*—41 (pl. 33, fig. 127†); *Otidea aurantia* var. *atromarginata*—4 (497); 8 (iv, 449); *Peziza aurantia* var. *atro-marginata*—35 (1891, 348); 11 (57); 14 (xiii, 73); 31 (11 Feb. 1882); 54 (iv, 731); as *Barlaea Crouani*—8 (iv, 395, p.p.). On the ground among moss.
- Neotiella Crozalsiana** Grel. 33 (xliii, 491*, 1929); Rev. mycol. (vii, n.s., 20†). Parasitic on *Plagiochila asplenoides*, Hampden Lees Wood, near Wendover.
- **Hetieri** Boud. 28 (ix, 46, 1923); Rev. mycol. (vii, n.s., 19). Amongst moss on burnt ground in pine woods.
- **microspora** Cooke & Mass. 28 (iv, 367); 8 (iv, 375); Massee in 14 (xxii, 44, 1893). On a dung hill.
- [— **ovilla** Peck var. **flavodisca** Cooke & Mass. in 14 (xxi, 71, 1893); apparently a synonym of *Peziza rutilans* Fr., or *Neotiella Polytrichi*—8 (iv, 372). On the ground, amongst moss.
- Perrotia flammea** (Alb. & Schw. ex Fr.) Boud. 28 (iv, 368); Boudier, Icones, pl. 321; *Dasyascypha*—Dennis (1949, 45); 8 (iv, 362); *Lachnella*—11 (407); *Peziza*—13 (316); 14 (iv, 121, 1876). Dry decorticated branches of willow and privet.
- Pithya Cupressi** (Batsch ex Phill.) Rehm 28 (iv, 368); *Pitya*—8 (iv, 291); *Lachnella*—54 (iv, 731); 11 (240*); *Peziza*—14 (xiii, 73, 1885); 54 (iii, 746, 1884). On leaves of *Juniperus Sabina*.
- Pseudombrophila pluvialis** (Cooke) Boud. 28 (iv, 368); *Peziza*—41 (pl. 23, fig. 90*); Cooke in 14 (iv, 111, 1875); as *Humaria domestica*—8 (iv, 421). On wall-paper and damp plaster walls.
- **tenuispora** (Cooke & Mass.) Boud. 28 (iv, 199 & 368; v, 187; xvi, 2); *Sarcoscypha*—Massee in 14 (xxi, 121, 1893); *Lachnea*—35 (1894, 170); *Geophyxis parvispora*—28 (iii, 131); 7 (252); 8 (iv, 381). On sticks and leaves.
- Pulvinula cinnabarina** (Fuckel) Boud. 28 (iv, 368); 115 (18); *Barlaea*—27 (i, 190); 8 (iv, 396); *Peziza laetirubra*—11 (85); 41 (pl. 5, fig. 20†); *Lamprospora laetirubra*—102 (iv, 213). On sandy ground.
- **constellatio** (B. & Br.) Boud. 28 (iv, 368; xx, 6); 115 (18); 108 (viii, Appendix, 317); Boudier, Icones, pl. 407†; Rev. mycol. (vii, n.s., 84†, ascus pore structure); *Peziza*—27 (xvii, 363); 11 (86); 40 (iv, n.s., 133); 41 (p. 45, pl. 21, fig. 81*); 14 (iv, 110); 13 (306); Berkeley & Broome in 19 (xvii, No. 1620, 1876). On the ground and at side of road.
- Trichophaea albo-spadicea** (Grev.) Boud. 28 (iv, 367); 54 (xv, 206); 115 (16); *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 178; *Lachnea*—35 (1904, 331); 7 (265); 8 (iv, 319); 40 (iv, n.s., 177); 11 (228); *Peziza*—13 (311); 65 (xiii, 44); 41 (pl. 36, fig. 141); 18 (368); 15 (684); 20 (194); 51 (420, 1824). On the ground.

- Trichophaea bulbo-crinata** (Phill.) Boud. **28** (iv, 367); *Lachnea*—**8** (iv, 323); **40** (iv, n.s., 177); **11** (227); *Peziza*—**40** (vi, 123, 1881, Phill. in litt.). On dead branches.
- **gregaria** (Rehm) Boud. **28** (iv, 367); **115** (16); Boudier, Icones, pl. 364†; *Patella*—Seaver, N. Amer. Cup Fungi, 1928, 176†; *Lachnea*—**7** (265); **8** (iv, 320); **11** (214); *Peziza*—**41** (p. 69, pl. 32, fig. 123*, 1876). On the ground.
- **leucothecioides** (Rehm) Boud. **28** (iii, 124, 1909; iv, 367). On charred wood, Oban.
- **sublivida** (Sacc. & Speg.) Boud. **28** (iv, 367); **115** (16); *Lachnea*—**7** (265); **8** (iv, 319, 1895). On thin layer of black dust on pig-iron in foundry at Hebden Bridge, Yorks; also on tan-refuse, Cullingworth, Yorks.
- **Woolhopeia** (Cooke & Phill.) Boud. **28** (iv, 367); **108** (viii, Appendix, 112 & 377); Boudier, Icones, pl. 365†; *Lachnea*—**102** (iv, 204); **8** (iv, 320); **11** (215); *Peziza*—**41** (pl. 113, fig. 404*); Cooke & Phillips in **14** (vi, 75, 1877). On burnt ground.

ASCOBOLACEAE

- Ascobolus aerugineus** Fr. **28** (iv, 368); **115** (18); **7** (298); **8** (iv, 160); **40** (iv, n.s., 182); **11** (287); **15** (727); **13** (337); **27** (ii, 152, 1864; Ann. Sci. nat. (x, 32, with figs.). On dung of horse and cow.
- **amethystinus** Phill. **28** (iv, 368); Phillips in **14** (iv, 84, p.p., 1875); as *Humaria Phillipsii*—**8** (iv, 417); also v. *Galactinia Phillipsii* (Cke.) Boud. On damp sandy soil on margin of river.
- **asininus** Cooke & Mass. **28** (iv, 368); **8** (iv, 159); Cooke & Massee in **14** (xxi, 72, 1893). On asses' dung.
- **atro-fuscus** Phill. & Plowr. **28** (iv, 368); **108** (viii, Appendix, 315); **115** (18); **7** (298); **11** (291); Phillips & Plowright in **14** (ii, 186, 1874; vi, 158, synonymy); *A. carbonicola* Boud.—Bull. Soc. Bot. Fr. (xxiv, 310); *A. viridis* Boud.—Ann. Sci. nat. (1869, x, ser. 5, p. 217). Probably = *A. carbonarius* Karst.—Boudier, Hist. et Class. Disc. d'Europe, 1907, 73. On charcoal and on road-scrappings.
- **Carletoni** Boudier in **28** (iv, 62*, 1913; iv, 368); **115** (18); Trans. Perthsh. Soc. nat. Sci. (vii, 10); **35** (1920, 263). On dung of horse, black-cock and capercaillie.
- **crenulatus** Karst. **8** (iv, 164); **40** (iv, n.s., 183); Trans. Perthsh. Soc. nat. Sci. (vii, 10); **11** (292); **13** (339); **14** (iv, 112, 1875). On grouse dung, and on ? cow dung.
- **Crouani** Boud. **28** (iv, 368); **115** (18); **70** (i, n.s., 298); **37** (1907, 240); **7** (298); **8** (iv, 164, 1895); Boudier in Ann. Sci. nat. (x, Ser. 5, 26†). On rotten leaves, wood, sacking and paper.
- **denudatus** Fr. **28** (iv, 368); **115** (18); **108** (viii, Appendix, 315); Boudier, Icones, pl. 408†; **33** (l, 334 & 702, sporulation); **7** (297); **8** (159); **11** (287); **15** (725); **19** (xv, No. 1083, with fig., 1865); **27** (ii, 150*, 1864); Ann. Sci. nat. (x, Ser. 5, 26†). On old fir poles, wood sawdust, on the ground attached to decayed leaves, etc.
- **glaber** Pers. ex Fr. **28** (iv, 368; xv, 327, cultural); **115** (18); **33** (xv, 317; xvi, 58); **106** (xi, 314); **7** (297); **8** (iv, 160); **40** (iv, n.s., 182); **11** (288); **15** (728); **13** (337); **27** (ii, 151*); **19** (xv, No. 1085*, with fig.); **18** (374); **20** (209, 1836); Ann. Sci. nat. (x, Ser. 5, 33†). Exs.: **43** (No. 96). On dung of cow, horse and rabbit.
- **glaber** var. **albidus** March. **28** (iv, 368); Bull. Soc. Bot. Belg. (xxxiv, 131, = *A. albidus* Crouan); **33** (xv, 317, 1901). On dung of rabbit.
- **Leveillei** Boud. **28** (i, 116; iv, 368; xviii, 128*, development and spore colour); **115** (18); **33** (l, 334 & 702, physiology); **7** (298); **35** (29, 1899); Halifax Nat. (iii, 128, 1899). On horse dung.
- **Masseei** Sacc. & Syd. in Saccardo, Syll. (xiv, 794); **28** (iv, 368); *Ascobolus marginatus* Massee—**8** (iv, 161); Massee in **14** (xxii, 98, 1894). Not *Ascobolus marginatus* Pat. On asses' dung.
- **minutus** Boud. **28** (i, 153, iv, 368); **115** (18); Boudier, Icones, pl. 411†; **7** (298); **35** (8, 1900; 1901, 180). On dung of dog, Hebden Bridge, Yorks.
- **perplexans** Mass. & Salm. **28** (i, 195; iv, 368); Massee & Salmon in **33** (xv, 328*, 1901; xvi, 58). On horse dung cultures at South Kensington and on dung of various 'non-British' animals at Kew.
- **stercorarius** [Bull.] Schroet. **28** (iv, 368; xiv, 286*; xvi, 321, cultural); **115** (18); Buller (Researches, vi, 273–8, heliotropism); **33** (xliii, 502; xlv, 621, sexuality, oidia); *Peziza*—**55** (687); **42** (pl. 18, pl. 389, figs. 3–6); **38** (Ed. 3, iv, 352); Abbot, Fl. Bedf., 1121; *Ascobolus furfuraceus*—**56** (xxvii, 235); **68A** (xxiv, 285); **33** (xv, 318);

- xxiii, 412 & 537; xxxix, 254, etc.); **102** (iv, 215, anatomy); **32** (vi, 156, fertilization); **7** (298); **8** (iv, 161); **40** (iv, n.s., 183); **11** (290); **27** (ii, 150*; xvii, 364; l, 192); **13** (337); **15** (727); **45** (xxiv, 154*); **18** (374); **51** (426); **39** (vi, pl. 307*); **20** (209); **92** (ii, 33); **120** (i, 674); as *Peziza fusca*—**111** (iii, pl. 109, fig. 2*); **38** (Ed. 2, iii, 442); as *Peziza atra*—**38** (Ed. 2, iii, 445); Hudson, Fl. Anglica (Ed. 2, 637, 1778); as *Peziza violacea*—Relhan, Fl. Cantab., 558. On dung-hills, especially on cow and horse dung.
- Ascobolus stictoides** Speg. **28** (iv, 76 & 368); **115** (18); **7** (298); **35** (1900, 8; 1901, 179); **40** (v, n.s., 90, 1891). On dung of dog.
- **vinosus** Berk. **28** (iv, 368); **115** (18); **106** (xi, 314); **7** (297); **8** (iv, 159); **40** (iv, n.s., 182); **11** (288); **15** (727); Ann. Sci. nat. (x, Ser. 5, 31†); **27** (ii, 151); **13** (337); **19** (xv₃, No. 1083*, with fig.); **18** (374*); Berkeley in **20** (209, 1836); *Ascophanus*—**33** (xv, 328). On dung of goose, rabbit, sheep.
- **viridis** Curr. **28** (iv, 368); **115** (18); **7** (298); **8** (iv, 165); **40** (iv, n.s., 182); **11** (289*); **15** (726); **109** ('1874', publ. 1880, 43); Ann. Sci. nat. (x, Ser. 5, pl. 5, fig. 4); **19** (xv₃, No. 1081); **27** (ii, 150); Currey in **45** (xxiv, 154, 1863). Exs.: **43** (No. 196). On clay and heavy soil.
- **viridulus** Phill. & Plowr. **28** (iv, 368; xviii, 128, development and spore coloration); **33** (l, 334 & 702, physiology); **8** (iv, 164); **11** (291); Phillips & Plowright in **14** (viii, 103, 1880). On dung of rabbits, grouse, and on birds' rejectamenta.
- Ascophanus argenteus** (Curr.) Boud. **28** (iv, 369); **115** (19); **40** (iv, n.s., 184); **11** (306); **7** (296); *Ascobolus*—**13** (338); **15** (730); **19** (xv₃, No. 1088, with fig.); **45** (xxiv, 496*); **27** (ii, 152*, 1864; xvii, 364). On cow dung.
- **aurora** (Cr.) Boud. **28** (iv, 369); **33** (xlviii, 261*, cytology & development); **8** (iv, 174); **11** (308); *Ascobolus*—**14** (i, 132); *Ascophanes*—**19** (vii, 4, No. 1329, 1871); *Peziza*—Ann. Sci. nat. (x, Ser. 5, 58†). On dung of cow and horse.
- **Bresadolae** Boud. **28** (xiii, 259, 1928). On rabbit dung, Blackdown, Mendips.
- **carneus** (Pers. ex Fr.) Boud. **28** (iv, 369); **27** (l, 192); **115** (19); Mykol. Zbl. (v(4), 177, cytology and development); **33** (xxiii, 399, sexuality and development; xxvii, 553); **40** (iv, n.s., 184); **11** (309); Ann. Sci. nat. (x, 250†); *Ascobolus*—**27** (ii, 152); **13** (338); **15** (731); **19** (xv₃, No. 1085*, with fig.); **18** (374, 1860). Exs.: **43** (No. 197). On cow, sheep, horse and rabbit dung, rotting cloth, sacking, leather, paper, etc.
- **carneus** var. **cuniculi** Boud. **28** (iv, 369); **115** (19); **11** (309); **14** (ii, 187, 1874); Boudier in Ann. Sci. nat. (x, 250*). Exs.: Cooke, 'Fung. Brit.', ii, No. 398. On rabbit dung.
- **cervarius** (Phill.) Boud. **28** (iv, 369; vii, 59); **115** (19); *Humaria*—**8** (iv, 421); *Peziza*—**40** (iv, n.s., 135); **11** (100); **14** (viii, 100); **13** (308, 1879, Phillips in litt.). On dung of roe-deer, red-deer and rabbit.
- **cinereus** (Cr.) Boud. **28** (iv, 369); **115** (19); **117** (xxxiv, 34, critical notes); **35** (1907, 353); **8** (iv, 175); **11** (308); Ann. Sci. nat. (x, Ser. 5, 59†); *Ascobolus*—**15** (731); **19** (xv₃, No. 1085, with fig., 1865). On horse, cow and rabbit dung.
- **consociatus** (B. & Br.) Phill. **28** (iv, 369); **115** (19); **8** (177); **11** (312); *Ascobolus*—**14** (iii, 123); Berkeley & Broome in **19** (xv₄, No. 1491, with fig., 1875). On remains of *Sphaeria cupulifera* and on wood.
- **deerratus** (Karst.) Boud. **28** (iv, 369); **115** (19); *Humaria*—**7** (260); **35** (28*, 1899); *Peziza*—**35** (1904, 360); as *Pseudombrophila Pedrotii* Boud.—Halifax Nat. ii, 58, 1897. On decaying flax lining of a cast-out hearth-rug, nr. Hebden Bridge, Yorks.
- **globoso-pulvinata** (Crossl.) Boud. in litt. **28** (iv, 369); **115** (19); *Humaria*—**7A** (1909 Ed., 306); Crossland in **35** (214, 1908); **28** (iii, 112). On sediment among *Bryum argenteum* in disused dye-tank, Hebden Bridge, Yorks.
- **glumarum** (Desm.) Boud. **28** (iv, 369); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 133; *Humaria*—**8** (iv, 415); *Peziza*—**11** (97); (pl. 10, fig. 39†); **15** (676); **18** (366); **19** (xiii, No. 768, 1854); Desmazières in Ann. Sci. nat. (xv, Ser. 2, 129). According to Masee, **8** (iv, 415), this species should be included in *Mollisia*. On chaff rotting on the ground.
- **granuliformis** (Cr.) Boud. **28** (iv, 369; xiv, 290*, morphology); **115** (19); **7** (296); **8** (iv, 174); **40** (iv, n.s., 184); **11** (307); Ann. Sci. nat. (x, Ser. 5, 55†); *Ascobolus*—**13** (338); **15** (729); **19** (xv₃, No. 1086, with fig.); **27** (ii, 152*, 1864). On cow dung.
- **hepaticus** (Batsch) Boud. **28** (iv, 369); **115** (19); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 139; *Humaria*—**8** (iv, 418); *Peziza*—**11** (99); **15** (702); **41** (pl. 22, fig.

- 85*); **19** (xv₃, No. 1069, with fig.); **38** (Ed. 2, III, 442, 1792). Exs.: Cooke, 'Fung. Brit.', I, No. 567; II, 191; **43** (No. 81). On the ground and on rabbit dung.
- Ascophanus Keithii** (Phill.) Boud. **28** (iv, 369); *Humaria*—**8** (iv, 420); *Peziza*—**40** (iv, n.s., 134); **11** (98); **14** (VIII, 100); **13** (308, 1879, Phillips in litt.). On horse dung.
- **lacteus** (Cooke & Phill.) Phill. **28** (iv, 369); **115** (19); **11** (306); *Helotium*—**8** (iv, 269); **33** (xv, 330); *Ascobolus*—Cooke & Phillips in **14** (v, 119, 1877). Exs.: **43** (No. 139). On cow and rabbit dung.
- **microsporus** (B. & Br.) Phill. **28** (iv, 369); **115** (19); **33** (xv, 328); **7** (295); **8** (iv, 173); **40** (iv, n.s., 184); **11** (307); *Ascobolus*—**15** (730); Berkeley & Broome in **19** (xv₃, No. 1087, with fig., 1865). On dung of cow, sheep, horse and rabbit.
- **minutissimus** Boud. **28** (iv, 369); **115** (19); **7** (296); **8** (iv, 177*); **11** (305); Boudier in Ann. Sci. nat. (x, Ser. 5, 53†); *Ascobolus*—**27** (xxII, 195*); Midl. Nat. (VI, 164, 1883). On dung of horse, sheep and cow.
- **misturae** (Phill.) Boud. **28** (iv, 369); *Humaria*—**8** (iv, 423); **46** (III, 66); *Peziza*—**11** (100); **46** (III, n.s., 66, 1880); **14** (x, 67); **27** (xvIII, 345); Phillips in **31** (308, fig. 58*, 1880); as *Humaria leporum*—**35** (1901, 188). Exs.: **43** (No. 157). On a mixture of lime and cow dung spread on trunks of apple trees, on the ground.
- **ochraceus** (Cr.) Boud. **28** (iv, 369); **115** (19); **106** (xxvII, 209); **33** (xv, 328; xvi, 66); **7** (296); **8** (iv, 176); **11** (311); Ann. Sci. nat. (x, Ser. 5, 57†); *Ascobolus*—**14** (v, 62, 1876). Exs.: Cooke, 'Fung. Brit.', Ed. II, No. 559, the specimen in Herb. Kew is, according to Massee, typical *Ascophanus granuliformis*. On dung of cow, horse, deer and sheep.
- **saccharinus** (Berk. & Curr.) Boud. **28** (iv, 369); *Ascobolus*—**15** (731); **19** (xv₃, No. 1091*, with fig.); **45** (xxIV, 495*); **27** (II, 154*; xvII, 364); Berkeley & Currey in **18** (374, 1860); as *Ascophanus carneus*—**8** (iv, 178); *Ascophanus carneus* var. *saccharinus*—**11** (310). On old leather and rags.
- **salmonicolor** (B. & Br.) Boud. **28** (iv, 369); *Humaria*—**8** (iv, 420); **27** (I, 190); **33** (xvi, 66); *Peziza*—**33** (xvi, 66); **11** (98); **36** (xxxI, 500); **41** (pl. 12, fig. 48*); **15** (677); Berkeley & Broome in **19** (xvIII, No. 1158, with fig., 1866). On sides of a ditch and on hare dung.
- **sexdecimsporus** (Cr.) Boud. **28** (iv, 369); **115** (19); **11** (311); Ann. Sci. nat. (x, Ser. 5, 247†); *Ascobolus*—**27** (II, 153*, 1864); **15** (730); **19** (xv₃, No. 1091, with fig.); *Ryparobius*—**7** (295); **8** (iv, 182); **106** (xi, 314). On dung of horse, cow and rabbit.
- **subfuscus** (Cr.) Boud. **28** (iv, 72 & 369); **8** (iv, 176); **11** (305); **40** (I, n.s., 87, 1883; iv, n.s., 184); Ann. Sci. nat. (x, Ser. 5, 52†). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 657. On dung of cow, dog and cat.
- **testaceus** (Moug. ex Fr.) Phill. **28** (iv, 369); **106** (xxvII, 27); **115** (19); **11** (310*); *Ascobolus*—**15** (732); **19** (xv₃, No. 1082*); *Peziza*—**19** (vII, No. 576, 1851; III₃, No. 826); *Helotium*—**15** (709); **18** (372); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 125; *Ascophanus carneus* var. *testaceus*—**7** (296); **8** (iv, 178). Exs.: **43** (No. 98). On old sacking, linen and woollen material; dung of rabbit and mouse, and on feathers.
- Ascozonus argenteus** (B. & Br.) Boud. **28** (iv, 369); **115** (19); *Ryparobius*—**7** (295); **11** (301); *Ryparobius* Berkeley & Broome in **19** (xI₄, No. 1394, with fig., 1873); as *Ascobolus cunicularius*—**27** (xII, 355*); as *Ascozonus cunicularius*—**109** ('1873', publ. 1874, 129). On rabbit and horse dung.
- **Crouani** Renny **28** (iv, 369); Renny in **109** ('1873', publ. 1874, 130*); **27** (xII, 356*); *Ryparobius*—**8** (iv, 181); **11** (300); *Streptotheca*—Seaver, N. Amer. Cup Fungi, 1928, 142. On rabbit dung.
- **Leveilleanus** Renny **28** (iv, 369); **115** (19); **106** (xxvII, 209); Renny in **109** ('1873', publ. 1874, 130*); *Ryparobius*—**7** (295); **8** (iv, 185); **11** (301); *Ascozonus Leveillei*—Renny in **27** (xII, 356*, 1874). On dung of rabbit, deer and vole.
- **niveus** (Fuekel) Boud. **28** (iv, 322 & 369); *Ryparobius*—**40** (iv, n.s., 183, 1889). On rabbit dung, Persley, near Aberdeen.
- **parvisporus** Renny **28** (iv, 369); Renny in **109** ('1873', publ. 1874, 131*); **27** (xII, 356*); *Ryparobius*—**8** (iv, 181); **11** (303). On rabbit dung.
- **sub-hirtus** Renny **28** (iv, 369); **115** (19); **27** (xII, 357*); Renny in **109** ('1873', publ. 1874, 131*); *Ryparobius*—**7** (295); **8** (iv, 184); **11** (302). On rabbit dung.
- **Woolhopensis** Renny **28** (iv, 369); Renny in **109** ('1873', publ. 1874, 130*); **27** (xII, 356*); *Ascobolus*—**14** (III, 185); *Ryparobius*—**8** (iv, 84); **11** (302); **19** (xI₄,

- No. 1395, with fig.); **14** (II, 163); *Streptotheca*—Seaver, N. Amer. Cup Fungi, 1928, 143†. On bird droppings.
- Boudiera areolata** Cooke & Phill. **28** (IV, 369); **115** (18); Boudier, Icones, pl. 417†; **11** (285*); Cooke & Phillips in **14** (VI, 76*, 1877); *Barlaea*—**8** (IV, 398). On damp ground.
- Cubonia Boudieri** (Renny) Sacc. **28** (IV, 369); **8** (IV, 173); *Ascophanus*—**11** (304, 1887, as *Ascobolus*—Renny in litt.); *Boudiera*—**27** (LXVIII, 135). On dung of rabbit and of ? water-rat.
- Dasyobolus barbatus** (Mass. & Crossl.) Sacc. **28** (IV, 368); **115** (18); *Ascobolus*—**7** (299); **8** (166); **35** (1894, 171); Massee & Crossland in **14** (XXII, 97*, 1894). On tan refuse.
- **brunneus** (Cooke) Sacc. **28** (IV, 368); **115** (18); *Ascobolus*—**7** (299); **11** (292); **15** (728); **105** (VI, 154, 1867). Exs.: Cooke, 'Fung. Brit.', No. 286. On dung of cow, horse and rabbit.
- **immersus** (Pers. ex Fr.) Sacc. **28** (IV, 368; xv, 328, cultures; xviii, 127–35, effect of ammonia); **115** (18); *Ascobolus*—**33** (xvi, 58); **27** (xvii, 364); **32** (xxxii, 185, spore discharge); **56** (xxxii, 235); Mykol. Zbl. (v(4), 185); **7** (299); **8** (IV, 1687); **40** (IV, n.s., 183); **11** (292); **13** (337); **15** (728); Ann. Sci. nat. (x, Ser. 5, 36†); as *Ascobolus macrosporus*—**19** (xv, No. 1089, with fig.); *Peziza immersa*—**58** (148); **42** (pl. 369, fig. 9, 1802). On dung of sheep, horse, cow and goose.
- Lasiobolus ciliatus** (Berk.) Sacc. **28** (IV, 369); **115** (19); *Ascobolus*—**13** (338); **15** (731); **19** (xv, No. 1083*, with fig.); **18** (374); **27** (II, 150; xvii, 364); Berkeley in **20** (209, 1836); *Ascophanus*—Ann. Sci. nat. (x, Ser. 5, 253); as *Ascophanus equinus*—**8** (IV, 179); *Ascophanus pilosus* var. *ciliatus*—**11** (312); **40** (IV, n.s., 184). On cow dung.
- **equinus** [Müll.] Karst. **28** (IV, 369); Glasg. Nat. (II, 94); **115** (19); *Ascobolus*—**28** (xviii, 129*, development); *Ascophanus*—**33** (xv, 324); **27** (I, 192); **7** (297); **8** (IV, 179); *Peziza*—**120** (I, 666); **42** (pl. 352, 1802). On dung of horse, sheep, cow, deer, dog, also of Mexican deer and elephant, Kew.
- **equinus** var. **pilosus** (Fr.) Sacc. **28** (IV, 369); *Ascophanus pilosus*—**40** (IV, n.s., 184); **11** (312); as *Ascophanus equinus*—**8** (IV, 179); *Ascobolus pilosus*—**14** (IV, 112, 1875); **40** (III, 202, 1875–6); **13** (339); Ann. Sci. nat. (x, Ser. 5, 64†). On dung of horse, ass, cow, rabbit and grouse.
- **macrotrichus** Rea in **28** (V, 440*, 1917; VII, 1); **108** (VIII, Appendix, 113); Trans. Perthsh. Soc. nat. Sci. (VII, 11). On dung of deer and sheep.
- **oligotrichus** A. L. Sm. & Ramsb. in **28** (V, 238, 1916); **106** (1917, 8). On dung of rabbit.
- Ramsbottomia lamprosporoidea** Buckley in **28** (IX, 44, 1923; x, 234). According to W. D. Buckley (in conversation) *Lamprospora perplexa* Seaver (1928) is probably the same species. On earth among moss, Argyllshire; on sawdust, Bettws-y-Coed.
- Rhyparobius albidus** Boud. **28** (IV, 317, 1914; IV, 369); Boudier, Icones, pl. 418†; Trans. Perthsh. Soc. nat. Sci. (VII, 11). On old hedge cuttings of *Cytisus scoparius*, showing traces of dung, Perth.
- **ascophanoides** (Heim.) Sacc. **28** (I, 195; IV, 369); **33** (xv, 323, 1901); *Ascophanus rhyparobioides*—**33** (xv, 327*). On rabbit dung.
- **brunneus** Boud. **28** (IV, 322 & 369); **117** (LII, 383); **40** (IV, n.s., 183, 1889). On dung of cow and grouse.
- **crustaceus** (Fuckel) Rehm **28** (IV, 369); **115** (19); *Rhyparobius Cookei* var. *crustaceus*—**40** (IV, n.s., 183); *Rhyparobius Cookei*—**7** (295); **8** (IV, 182*); **11** (299*); Ann. Sci. nat. (x, Ser. 5, 48†); *Ascobolus Cookei*—**13** (338); **19** (XI, No. 1393); **14** (I, 132, 1873). On dung of horse, cow, rabbit, dog, etc.
- **crustaceus** var. **myriadeus** Karst. **28** (IV, 322 & 369); **40** (IV, n.s., 183, 1889). On dung of horse and sheep.
- **dubius** Boud. **28** (III, 378; IV, 369); **115** (19); **11** (300); **7** (295); **8** (IV, 183); **46** (pt. 2, 349); **14** (II, 163); **19** (XI, No. 1392, 1873); Ann. Sci. nat. (x, Ser. 5, 240†). On dung of rabbit, horse, sheep and grouse.
- **dubius** var. **lagopi** Boud. **28** (III, 378, 1912; IV, 369); Trans. Perthsh. Soc. nat. Sci. (VIII, 11). On grouse dung.
- **myriosporus** (Cr.) Boud. **28** (IV, 322 & 369); **40** (IV, n.s., 183, 1889). On dung of sheep and horse, Orkney.
- **pachyascus** Rehm **35** (353, 1907). On rabbit dung, Yorkshire.
- **tenacellus** Phill. **28** (IV, 369); **8** (IV, 181); Phillips in **14** (XIX, 74, 1891). On rabbit dung.

- Saccobolus caesariatus** Renny in litt. ap. Phillips **28** (iv, 369); **8** (172); **11** (297, 1887, Renny in litt.). No habitat given by Phillips and Massee merely copied Phillips's account.
- **depauperatus** (B. & Br.) Rehm **28** (iv, 369; xviii, 130, culture and development); **115** (18); **7** (299); **8** (170); **33** (xv, 330); **40** (iv, n.s., 183); **11** (296); *Ascobolus*—Berkeley & Broome in **19** (xv₃, No. 1084, with fig., 1865); **40** (vi, 219). On dung of sheep, horse and deer.
- **globulifer** Boud. **28** (ix, 47, 1923). On manure-heap, apparently on horse dung, Leeds.
- **granulispermus** Sopp. & Crossl. **28** (i, 116; iv, 369); **115** (18); **7** (299); Soppit & Crossland in **35** (30*, 1899). On cow and ox dung.
- **Kerverni** (Cr.) Boud. **28** (iv, 369); **115** (18); **7** (299); **8** (iv, 171*); **33** (xv, 329, xvi, 66); Ann. Sci. nat. (x, Ser. 5, 229†); *Ascobolus*—**15** (729); **19** (xv₃, No. 1090, with fig.); **27** (ii, 153*, 1864). On cow dung, and on dung of Mexican deer and Dorcas goat, Kew.
- **neglectus** Boud. **28** (iv, 369); **115** (18); **7** (299); **8** (171); **33** (xv, 330; xvi, 66); **40** (iv, n.s., 183); **11** (295); Ann. Sci. nat. (x, Ser. 5, 41†); *Ascobolus*—**14** (x, 69); **13** (338, 1879). On dung of cow, sheep and rabbit.
- **obscurus** (Cooke) Phill. **28** (iv, 369; xv, 329*, cultures); **8** (169); **11** (295); *Ascobolus*—Cooke in **14** (iv, 112, 1875). On old sacking.
- **quadrisporus** Mass. & Salm. **28** (i, 196; iv, 369); Massee & Salmon in **33** (xv, 329*, 1901). On dung of ass, sheep and rabbit.
- **violascens** Boud. **28** (iv, 369); **115** (18); **7** (299); **8** (iv, 170); **11** (296*); **14** (iii, 126, 1875); Boudier in Ann. Sci. nat. (x, Ser. 5, 41†). Exs.: **43** (No. 48). On dung of cow and rabbit.
- Sphaeridiobolus Crosslandi** Boud. **28** (i, 116; iv, 368); **115** (18); *Ascobolus*—**7** (297); **35** (1899, 29*; 1901, 179); *Ascobolus* (*Sphaeridiobolus*) *Crowslandi* Boudier in **117** (xiv, 126*, 1898); *Boudiera*—**35** (1901, 179). On dog dung, Halifax.
- **hyperboreus** (Karst.) Boud. var. **niveus** Quél. **28** (iv, 316, 1914; iv, 369); Trans. Perthsh. Soc. nat. Sci. (vii, 10). On old hedge cuttings showing trace of mouse dung, Perth.
- Thecotheus Pelletieri** (Cr.) Boud. **28** (iv, 369); **115** (19); **11** (297*); Bot. Gaz. (LXII, 450, morphology); Ann. Sci. nat. (x, Ser. 5, 46†); *Pyrapobius*—**7** (295); **8** (iv, 180*); *Ascobolus*—**14** (x, 69, 1881). On dung of horse, cow, sheep and dog.
- Thelebolus nanus** Heim. **28** (i, 115, 1900; iv, 369); as *T. stercoreus* Zukal—**28** (i, 195); **33** (xv, 326*); **7** (294); **56** (xxvii, 235). On rabbit dung.
- **stercoreus** Tode ex Fr. **28** (iv, 369); **115** (19); apparently confused with *T. nanus* v. above. On dung of rabbit and horse.
- **terrestris** (Alb. & Schw. ex Fr.) Tode **115** (19); **19** (vii₃, No. 964, 1861); Proc. Hampshire Fld Cl., 1910, 337. On fir leaves, Richmond, Yorks.

OPERCULEAE IMMARGINATAE

PYRONEMACEAE

- Ascodesmis nigricans** van Teigh. **28** (iv, 370); **8** (iv, 19*, 1895); Gwynne-Vaughan & Barnes, 'Fungi', Cambridge Handbk., 1922, for development; Rev. mycol., n.s., xiv, 85 for structure and taxonomy; Bull. Soc. Bot. Fr. xxiii, 271; Botaniste, x, 247, nomenclature; *Boudiera hypoborea*. Bot. Ztg. (LXIII, 1). On dung of horse and sheep.
- **volutelloides** Mass. & Salm. **28** (iv, 370); Massee & Salmon in **33** (xvi, 61, 1902); Sacc. Syl. (xviii, 29). On dung of kangaroo, Kew.
- Pyronema domesticum** (Sow. ex Fr.) Sacc. **28** (iv, 370); **115** (19); **33** (xli, 321, cytology; l, 702, sporulation); *Humaria*—**33** (xvi, 66); *Peziza*—**40** (iv, n.s., 135); **11** (107); **14** (v, 60); **109** ('1876', 225, 1880); **15** (692); **18** (369); **20** (199); **120** (i. 666); Sowerby in **42** (pl. 351, 1802); *Peziza pluvialis*—**41** (pl. 23, fig. 90*). Damp plaster walls, etc., burnt ground, burnt cabbage stalks.
- **glaucum** Boud. **28** (xiii, 259, 1928); **108** (viii, Appendix, 113). On partially sterilized earth in greenhouse and on old charcoal heaps.
- **omphalodes** (Bull. ex Fr.) Fuckel **28** (iv, 370); **115** (19); Boudier, Icones, pl. 251†; **100** (ii, 109, physiology of heating effects); *Humaria*—**115** (17); **8** (iv, 410); *Peziza*—

- 11 (106*); 41 (pl. 17, fig. 65); 15 (676); 18 (366); *Pyronema confluens*—28 (v, 280, cytology); 33 (xiv, 321, morphology and reproduction; xxxvii, 342, apical growth; xl, 245, physiology; xli, 321, cytology; xlv, 356, life history); 73 (i, Ser. 4, 205*, chromosome cycle); 32 (xxx, 70, white form); 68A (xxiv, 285); 114 (1865, 197*); *Pyronema marianum*—19 (i, No. 9); *Thelephora carbonaria*—20 (169, 1836). On burnt ground and on sterilized soil.
- Pyronema Piggottii** (B. & Br.) Boud. 28 (iv, 370); 115 (19); *Humaria*—115 (17); 8 (iv, 407); *Peziza*—11 (106); 36 (xxxi, 496); 15 (693); 18 (369); Berkeley & Broome in 19 (xiii, No. 769, 1854): ? = *Pyronema domesticum*. On plaster ceilings.

EXOASCACEAE

- Exoascus alnitorquus** (Tul.) Sadeb. 28 (iv, 370); 89 (217); *Ascomyces*—8 (iv, 16); *Ascomyces Alni* B. & Br. in 19 (xvii, No. 1628, 1876); 11 (403); 14 (v, 62); as *Taphrina Alni-incanae*—27 (lxxiii, 101); 70 (xxi, 401). Blisters on leaves of *Alnus glutinosa* and on female catkins of *A. glutinosa* and *A. incana*.
- **bullatus** (B. & Br.) Fuckel 28 (iv, 370); 89 (122*); Wormald, 'Diseases of Fruits and Hops', London, 1939, 126; 78 (1923, 89*); 93 (121); 65 (xxx, 339); 112 (117); *Taphrina*—85 (xxvii, 87); *Ascomyces*—8 (iv, 15); 11 (401); 56 (iii, p. lxxviii); 15 (737*); 18 (376); 91 (284*); *Oidium*—Berkeley & Broome in 56 (ix, 51*, 1855). Blisters on leaves of pear, quince, medlar and hawthorn.
- **Cerasi** Fuckel 28 (xiv, 163); 89 (130); 5B (89 & 358, 1907); 79 (v, 30); *Taphrina cerasi* (Fuckel) Sadeb.—Wormald, 'Diseases of Fruits and Hops', London, 1939, 165; 93 (149); 65 (xxx, 339); 112 (116); 85 (xvii, 320); Flora (xcii, 1, cytology). Witches' brooms on cherry.
- **Crataegi** Sadeb. 28 (iv, 323, 1914; iv, 370); 70 (xxi, 401). On leaves and flowers of *Crataegus oxyacantha*, at Oxted.
- **deformans** (Berk.) Fuckel 28 (iv, 13 & 370); 56 (xxv, 163; xxviii, 24*, 269; xli, 110, control; xlii, 21); 31 (9 July 1887, 53; 13 May 1905, 294†); 65 (xxix, 186); 89 (133*); 37 (87*); 79 (i, 8 & 30); 23 (iv, 55; xi, 642; xiv, 164; xv, 203; xxvi, 823, etc.); 33 (xix, 325, cytology); 99 (xiv, 217); 7 (310); *Taphrina*—Wormald, 'Diseases of Fruits and Hops', London, 1939, 155; 93 (152, 197); 85 (xli, 16); 79 (viii, 25; xi, 50); 65 (xxx, 339); 112 (114); 27 (lxxiii, 101); 99 (xv, 67; xxv, 41*, life history); Flora (xcii, 1–31, cytology); *Ascomyces*—8 (iv, 15*); 11 (401); 18 (376*); 15 (737); Berkeley in 91 (284, 1857). Leaf curl of peach, nectarine, almond, apricot, also witches' brooms of plum, cherry and bird cherry.
- **instittiae** Sadeb. 22 (lii, 1926); *Taphrina instittiae* (Sadeb.) Johans—93 (144); Wormald, 'Diseases of Fruits and Hops', London, 1939, 142; 28 (xiv, 162); 112 (117). Witches' brooms on damson and plum.
- **minor** Sadeb. 79 (ii, 31; v, 26); *Taphrina*—93 (149); Wormald, 'Diseases of Fruits and Hops', London, 1939, 167; 28 (xiv, 163); 65 (xxx, 338); 79 (xi, 51); 112 (117); 85 (xvii, 320, 1908). Leaf curl of cherry.
- **Potentillae** (Farl.) Sacc. 28 (iv, 370); Glasg. Nat. (viii, 5); *Ascomyces*—8 (iv, 16); 11 (402, 1887); *Taphrina*—Bot. Gaz. (xcviii, 339, morphology and cultures). On leaves and stems of *Potentilla tormentilla* and *P. erecta*.
- **Pruni** Fuckel 28 (iv, 370); 56 (xxviii, 18*); 79 (vi, 28); 23 (xxx, 575); 97 (107); 7 (309); 89 (126*); *Taphrina*—93 (144 & 150); 85 (xxxi, 21); Wormald, 'Diseases of Fruits and Hops', London, 1939, 152; 65 (xxx, 339); 112 (116); 33 (xiv, 239); *Ascomyces*—8 (iv, 14); 11 (400); 13 (342); 14 (v, 62); *Ascomyces Pruni* B. & Br.—Berkeley & Broome in 19 (xvii, No. 1629, 1876). Causing pocket or bladder in plums, and cherry leaf curl.
- **turgidus** Sadeb. 28 (iv, 370); 7 (310); 27 (i, 193); 40 (viii, 229, 1886); 56 (xxix, 377); 89 (215); *Taphrina*—93 (219); 112 (117); *Ascomyces*—8 (iv, 17); 11 (404). Witches' brooms of birch.
- Taphrina aurea** [Pers.] Fr. 28 (iv, 370); 93 (221); 27 (i, 193); 7 (310); 65 (xxx, 349); 112 (117); 89 (220*); 40 (vii, 88, 1883); 56 (xxix, 382*); *Ascomyces*—8 (iv, 16*); 14 (xvii, 46). On leaves of poplar species.
- **caerulescens** (Desm. & Mont.) Tul. 28 (iv, 322 & 370); Trans. Perthsh. Soc. nat. Sci. (ii, 130, 1895). On oak leaves.
- **carpini** Rostr. 28 (v, 237, 1915); 62 (xii, 83). On *Carpinus Betulus*.

- Taphrina Johansonii** Sadeb. 71 (xxviii, 132, 1909); Flora (lxxxviii, pt. 2, 229, cytology; xci, 1-31, cytology). On carpels of aspen.
- **marginata** Lamb & Fautr. 70 (xvi, 400, 1936). On *Crataegus*, Parknasilla, Kerry.
- **rhizophora** Johans. 28 (iv, 12, 167 & 370); 27 (L, 230, 1912); Saccardo, Syll. Fung., viii, 813 = *T. aurea* auct. (p.p. in carpellis). In young inflorescences of poplar species.
- **Sadebeckii** Johans. 28 (iv, 370); 56 (xxix, 379); 40 (x, 69); 89 (217*); *Exoascus flavus*—56 (xxix, 379); 89 (217*); *Taphrina Tosquinetii*—28 (xiii, 311); *Ascomyces Tosquinetii*—11 (403); 14 (vi, 25, 1877); 13 (342); 56 (xxix, 379). Leaf blister of alder leaves.

Species to be excluded

- Ascomyces Juglandis** Berkeley in 18 (376, 1860); 15 (737); 11 (404); treated as 'excluded species' by Massee in 8 (iv, 18) as the descriptions are valueless and there is no type. On walnut leaves.
- **orientalis** Berkeley in 18 (376, 1860); 13 (341); 56 (vii, 266); 15 (737); 8 (iv, 18). Phillips in 11 (405) mentions that only *Tubercinia orientalis* is now to be found on Berkeley's original specimens. On *Trientalis Europaea*.

TUBERALES

- Amylocarpus encephaloides** Curr. 33 (xxiii, 262*); Hedwigia (xxxviii, 1-19, development); 4 (508); 15 (743); 18 (377); Currey in 67 (ix, 122, 1859); Glamorgan County History, (1, 203, ? fungus). On fragments of wood, on sands by shore at Sketty, Swansea.
- Balsamia fragiformis** Tul. Ramsbottom, Handbk., 198; 33 (xxiii, 253, 1909); 4 (503); Tulasne, Fungi Hypog., 125†. Collected by C. E. Broome at Batheaston.
- **platyspora** B. & Br. Ramsbottom, Handbk., 198; 33 (xxiii, 253*); 4 (503); 15 (747); 18 (378); Tulasne, Fungi Hypog., 124†; Berkeley & Broome in 19 (xiii, No. 318, 1844). Under trees and bushes.
- **vulgaris** Vitt. Mon. Tuberacearum, 30†; Ramsbottom, Handbk., 198; 33 (xxiii, 252); Tulasne, Fungi Hypog., 123†; for relationship with Pezizales see Rev. mycol. (iii, n.s., Mem., No. 1). Under trees.
- Choeromyces meandriformis** Vitt. Ramsbottom, Handbk., 201; 33 (xxiii, 261*); *Choiromyces*—28 (ii, 103); 27 (xvii, 364); 56 (xxviii, 510*); 68A (v, 132); 15 (742); 18 (377); 31 (1847, 670); 106 (xv, 284); 108 (viii, Appendix, 111); Vittadini, Mon. Tuberacearum, 51†; Tulasne, Fungi Hypog., 170†; Ann. Mag. nat. Hist., xviii, 80; *Tuber*—4 (508); *Tuber album*—42 (pl. 310*); 38 (Ed. 2, iii, 458, 1792). In the ground, often partly exposed.
- Elaphomyces anthracinus** Vitt. Ramsbottom, Handbk., 197; 33 (xxiii, 248*); 4 (500); 15 (749); 18 (378); 19 (vi, No. 211, 1841); Vittadini, Mon. Tuberacearum, 66†. In clay soil under trees.
- **cervinus** (L. ex Fic. & Schub.) Schlectendal 102 (xxvii, 173); 38 (Ed. 2, iii, 459, 1792); *Lycoperdon*—111 (pl. 116, 1789); according to C. W. Dodge. 102 (xxvii, 173), this species is identical with *E. granulatus*.
- **citrinus** Vitt. 33 (xxiii, 250). Massee says that this species has been recorded for England, but he has not been able to corroborate this.
- **granulatus** Fr. Ramsbottom, Handbk., 197; 33 (xxiii, 249); J. Cairngorm Cl. (1902, 373); 40 (1902, 126); 28 (v, 376, eaten by rodents); 117 (xxiii, 86); 4 (501); 27 (xvii, 364); 7 (241); 15 (750*); 18 (378); 19 (vi, No. 211*, with fig.); 20 (306, 1836); Tulasne, Fungi Hypog., 109†. Attached to roots of trees, subterranean especially in beech woods.
- **leucosporus** Vitt. 33 (xxiii, 249, 1909); 4 (501). Found by Broome near Chudleigh, Devon according to Massee. Under oaks.
- **variegatus** Vitt. Ramsbottom, Handbk., 197; 33 (xxiii, 249*); 102 (xxvii, 167); 4 (501); 15 (749); 18 (378*); Vittadini, Mon. Tuberacearum, 68†; *E. muricatus*—20 (307, 1836); 19 (vi, No. 212*). Under trees in woods.
- Genea hispidula** Berkeley in Tulasne, Fungi Hypog., 121*; Rev. mycol. (iii, n.s., Mem. No. 1); Ramsbottom, Handbk., 197; 4 (502); 33 (xxiii, 252*); 46 (i, n.s., 293); 15 (748); 19 (xv, No. 1094*); *Genea papillosa* Vitt.—Ann. Mag. nat. Hist. (xviii, 76, 1846); 18 (378). In the ground under chestnuts.

- Genea Klotzschii** B. & Br. Ramsbottom, Handbk., 197; **33** (xxiii, 251*); **4** (502); **15** (748); **18** (378); Berkeley & Broome in Ann. Mag. nat. Hist. (xviii, 78, 1846); Tulasne, Fungi Hypog., 120†. Near soil surface.
- sphaerica** Tul. Ramsbottom, Handbk., 197. In calcareous woods.
- verrucosa** Vittadini Mon. Tuberacearum, 28†; Ramsbottom, Handbk., 197; **33** (xxiii, 251); **4** (502); **15** (748); **18** (378); Ann. Mag. nat. Hist. (xviii, 78); *G. papillosa*—**19** (xiii, No. 315, 1844). Under oaks and chestnuts in clay soil.
- gyrocratera** **Pluotneriana** Henn. var. **sabuletorum** Ramsb. in E. Fischer (Mitt. Bern naturf. Gesell. (1926), 113, 1927), Fischer states that it differs from the type in the possession of subhymenial asci. Gathered by E. J. H. Corner, sandy soil under *Pseudotsuga Douglasii*, Bedford, 16 May 1926.
- Hydnobolites cerebriformis** Tul. Ramsbottom, Handbk., 198; Rev. mycol. (iii, n.s., Mem. No. 1); **33** (xxiii, 253*); **4** (503); **15** (746*); **18** (378); Tulasne, Fungi Hypog., 126†; *Hydnotrya*—Ann. Mag. nat. Hist. (xviii, 78, 1846). Under moss or fallen leaves in woods.
- Hydnotrya Tulasnei** B. & Br. **28** (ii, 101); **33** (xxiii, 254*); Ramsbottom, Handbk., 198; **4** (503); **27** (ix, 273); **15** (745); **18** (377); Ann. Mag. nat. Hist. (xviii, 78); Berkeley & Broome in **19** (xiii, No. 317, 1844); Tulasne, Fungi Hypog., 127†. Sandy ground.
- Pachyphloeus citrinus** B. & Br. Ramsbottom, Handbk., 199; Rev. mycol. (iii, n.s., Mem. No. 1, 36†); **33** (xxiii, 255); **4** (504); **15** (744); **46** (i, n.s., 293); **18** (377); Berkeley & Broome in Ann. Mag. nat. Hist. (xviii, 79, 1846); Tulasne, Fungi Hypog., 132. Under ground in woods.
- conglomeratus** B. & Br. Ramsbottom, Handbk., 199; **33** (xxiii, 255); **46** (i, n.s., 293); **15** (744); **4** (504); Berkeley & Broome in Ann. Mag. nat. Hist. (xviii, 80, 1846); Tulasne, Fungi Hypog., 132. Under ground in woods.
- melanoxanthus** Tul. Ramsbottom, Handbk., 199; **33** (xxiii, 255); **4** (504); **15** (743); **18** (377); Tulasne, Fungi Hypog., 131†; *Choitomyces*—**19** (xiii, No. 319, 1844). Among humus in oak and beech woods.
- Pseudobalsamia microspora** Diehl. & Lamb. in **100** (xxii, 223); **31** (No. 2591, 147, 1936); **34** (xxviii, 85*); **85** (xliii, 15). On mushroom beds.
- Stephania bombycina** Tul. Ramsbottom, Handbk., 198; Rev. mycol. (iii, n.s., Mem. No. 1); **33** (xxiii, 254*); **4** (504); **15** (745*); **18** (377); Tulasne, Fungi Hypog., 130†; *Genea*—**19** (xiii, No. 316, 1844); Vittadini, Mon. Tuberacearum, 29†. Subterranean in woods.
- Terfezia leonis** Tul. **33** (xxiii, 261*, 1909); Tulasne, Fungi Hypog., 173†. Doubtful record. Subterranean or partly exposed.
- Tuber aestivum** Vitt. Ramsbottom, Handbk., 200; **33** (xxiii, 256); **115** (30); **4** (505); **7** (242); **27** (iii, 137); **15** (738); **18** (376*); **117** (xxxvii, 199); in *Tuber cibarium*—**20** (228); **42** (pl. 309); **38** (Ed. 2, iii, 458, 1792). Subterranean in woods, especially beech.
- bituminatum** B. & Br. **33** (xxiii, 256); **4** (505); **27** (iii, 138); **15** (739); **18** (376); Berkeley & Broome in **19** (vii, No. 581, 1851), ? = *T. mesentericum* Vitt. In deep sand.
- brumale** Vitt. Ramsbottom, Handbk., 201; Rev. mycol. (iii, n.s., Mem. No. 1, structure and affinities); **33** (xxiii, 259†); **4** (506); **15** (740*); **27** (iii, 139); **18** (376); Ann. Mag. nat. Hist. (xviii, 80); Vittadini, Mon. Tuberacearum, 37†; Tulasne, Fungi Hypog., pl. 17, fig. 3†; as *T. melanosporum*—**19** (xiii, No. 320, 1844); **31** (1847, 670; 1856, 787). Subterranean in woods.
- dryophilum** Tul. Ramsbottom, Handbk., 201; **33** (xxiii, 258); **4** (506); **106** (xv, 284); **15** (742); **18** (376); **27** (iii, 140); Ann. Mag. nat. Hist. (xviii, 80, 1846); Tulasne, Fungi Hypog., 147†. Subterranean under oaks and poplars.
- excavatum** Vitt. **33** (xxiii, 257*); Rev. mycol. (iii, n.s., Mem. No. 1, 68); **4** (505); **15** (740); **19** (xv, No. 1094); **27** (iii, 11, 1864; iii, 138*; xvii, 364); **46** (i, n.s., 291); Tulasne, Fungi Hypog., 144†; Vittadini, Mon. Tuberacearum, 49†. Subterranean in woods.
- ferrugineum** Vitt. **33** (xxiii, 260); **4** (507); **31** (590, 1843); Vittadini, Mon. Tuberacearum, 46†; Tulasne, Fungi Hypog., 141. Subterranean.
- foetidum** Vitt. **33** (xxiii, 257, 1909); **4** (505); Vittadini, Mon. Tuberacearum, 41†; Tulasne, Fungi Hypog., 140†. Subterranean in woods.

- Tuber macrosporum** Vitt. Ramsbottom, Handbk., 201; **33** (xxiii, 257); **4** (505); **15** (739); **27** (iii, 138); **18** (376); **19** (vii, No. 580, 1851); Tulasne, Fungi Hypog., 139†; Vittadini, Mon. Tuberacearum, 35†. Under oak, willow, poplar, etc.
- **maculatum** Vitt. Ramsbottom, Handbk., 201; two gatherings by Plowright and named by Broome in Herb. B.M. Subterranean in woods.
- **mesentericum** Vitt. Ramsbottom, Handbk., 200; regarded as var. of *T. aestivum* by Fischer in Rabenhorst, Krypt. Fl., 1897, 39. Subterranean in woods.
- **nitidum** Vittadini, Mon. Tuberacearum, 48†; Ramsbottom, Handbk., 201; **4** (507); **15** (741); **27** (iii, 139); **18** (376); **19** (xiii, No. 321, 1844); *Tuber intidum*—**33** (xxiii, 260); *Tuber Berkeleyanum*—Tulasne, Fungi Hypog., 151. Subterranean in woods.
- **puberulum** B. & Br. in Ann. Mag. nat. Hist. (xviii, 81, 1846); Ramsbottom, Handbk., 201; **33** (xxiii, 258); **4** (506); **46** (i, n.s., 291); **15** (741); **27** (iii, 140); **18** (376). Exs.: Cooke, 'Fung. Brit.', No. 480. In sandy ground.
- **rapaeodorum** Tul. **33** (xxiii, 258); **4** (506); Tulasne, Fungi Hypog., 147†. ? = *T. puberulum*—Fischer, Rabenhorst, Krypt. Fl., 1896, 45; also in Rev. mycol. (iii, n.s., Mem. No. 1, 67). Sandy soil under trees.
- **rufum** Pico Ramsbottom, Handbk., 201; Rev. mycol. (iii, n.s., Mem. No. 1); **33** (xxiii, 259); **4** (507); **27** (iii, 139); **15** (741); **18** (376); **19** (xiii, No. 322, 1844). In woods, under ground or partly exposed.
- **scleroneuron** B. & Br. **33** (xxiii, 260); **4** (507); **27** (iii, 138); **15** (740); **18** (376); Berkeley & Broome in **19** (vii, Ser. 2, No. 582, 1851). Subterranean.

INOPERCULEAE MARGINATAE

GEOGLOSSACEAE

- Geoglossum difforme** Fr. **28** (iv, 370; xv, 115*, morphology); **115** (20); Ramsbottom, Handbk., 184; **102** (vi, 421); **27** (xvii, 363); **8** (iv, 492); **11** (35); **40** (iv, n.s., 130); **41** (pl. 2, fig. 7); **15** (664*); **18** (362); **20** (178, 1836); *Geoglossum glabrum* var. *difforme*—**7** (248); **33** (xi, 248); ? = *G. Peckianum* Cooke q.v. Exs.: Berkeley, 'Brit. Fung.', No. 256; Cooke, 'Fung. Brit.', Ser. 1, 481. On the ground in grassy places.
- **glutinosum** Pers. ex Fr. **28** (iv, 307); Ramsbottom, Handbk., 184; **33** (xi, 245*); Ark. Bot. (xxxa, No. 4, 32, for revision of the family); **115** (20); Boudier, Icones, pl. 422†; **102** (vi, 419); Proc. Hampshire Fld Cl. (1910, 339); **8** (iv, 490*); **11** (38); **40** (iv, n.s., 130); **41** (pl. 2, fig. 6); **15** (663); **18** (362); **19** (xiii, No. 290); **20** (178, 1836); **39** (pl. 55*). On the ground in grassy places.
- **ophioglossoides** [Linn.] Sacc. **28** (iv, 370); **115** (20); Boudier, Icones, pl. 423†; **102** (iv, 217, anatomy); *Clavaria*—**58** (153); **38** (Ed. 2, iii, 453); **111** (pl. 111, fig. 2*); **95** (Ed. 2, 1058); Hudson, Fl. Anglica (Ed. 1, 500, 1762); Relhan, Fl. Cantab., 467; *Geoglossum glabrum*—Ramsbottom Handbk., 184; **115** (20); **70** (i, n.s., 297); **102** (vi, 425); **7** (248); **27** (xvii, 363; L, 189); Proc. Hampshire Fld Cl. (1910, 339); **33** (xi, 246*); **8** (iv, 491); **40** (iv, n.s., 130); **11** (36); **41** (pl. 3, fig. 9); **15** (663); **18** (362); Proc. Somersetsh. archaeol. nat. Hist. Soc., (1853, 145); **20** (178); **120** (i, 658). Exs.: **43** (No. 55). On the ground in grassy places, in pastures.
- **Peckianum** Cooke **115** (20); **41** (pl. 2, fig. 5†); **33** (xi, 250*, Masee states, 'a specimen from Sowerby's herbarium, now at Kew, called *G. difforme*'). On swampy ground.
- **viscosum** Pers. ex Fr. **28** (iv, 370); Ramsbottom, Handbk., 184; **8** (iv, 490); **11** (37); **40** (iv, n.s., 130); **41** (pl. 3, fig. 10); **15** (663); **20** (178); **51** (416); **39** (i, pl. 55*, 1823). On the ground in moist meadows.
- Leptoglossum tremellosum** Cooke **28** (iv, 370); Ramsbottom, Handbk., 184; **115** (20); *Geoglossum*—**11** (39); **40** (iv, n.s., 130); **41** (pl. 96, fig. 347*); **13** (300); *Mitula microspora* var. *tremellosum*—**8** (iv, 484); **33** (xi, 282); *Geoglossum microsporum* var. *tremellosum* Cooke in **14** (iv, 109, 1875); **40** (iii, 200); **7** (250). On the ground.
- Microglossum arenarium** Rostr. **28** (iv, 35, 1913; iv, 196 & 370); *Mitula*—**33** (xi, 283, Masee states that the fungus is unknown to him). On Culbin sandhills, near Forres, Scotland.
- **atro-purpureum** (Batsch ex Fr.) Karst. **28** (iii, 220; iv, 370; x, 235); Trans. Butesh. nat. Hist. Soc. (vi, 84, 1913); *Geoglossum*—**41** (pl. 4, fig. 16†); *Corynetes atro-purpureus* (Batsch ex Fr.) Dur.—Ark. Bot. (xxxa, 9). In grassy places.

- Microglossum olivaceum** (Pers. ex Fr.) Gill. 28 (iv, 370); 115 (20); 102 (vi, 409); *Mitrlula*—Ramsbottom, Handbk., 183; 7 (249); 33 (xi, 270); 8 (iv, 483); *Leptoglossum*—11 (33); *Geoglossum*—15 (663); 41 (pl. 4, fig. 13*); 18 (361*); 19 (xiii, No. 765, 1854); *Geoglossum olivaceum* var. *purpureum*—15 (663); 18 (361*). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 650; Ed. 2, No. 396; Phillips, 'Elv. Brit.', No. 5. On the ground in open grassy places.
- robustum** (Durand) Ramsb. & A. L. Sm. 28 (iv, 320); 48 (xxiii, 49, 1914); *M. rubrum* (misprint)—28 (iv, 370); according to Miss E. M. Wakefield in litt., re-examination of the original material at Kew has shown this to be *G. atropurpureum*. Top of Montpelier Hill, Dublin.
- viride** (Pers. ex Fr.) Gill. 28 (iv, 370; xv, 111*, morphology); 115 (20); 48 (xxvi, 55); 102 (iv, 219; vi, 411); *Mitrlula*—115 (20); Ramsbottom, Handbk., 183; 8 (iv, 482); 33 (xi, 269); *Leptoglossum*—11 (32*); 40 (iv, n.s., 130); *Geoglossum*—70 (i, n.s., 297-8); 15 (662); 41 (pl. 4, fig. 14*); 18 (361); 20 (179); 39 (iv, pl. 211*); 120 (i, 659, 1821); *Geoglossum mitrata*—92 (ii, 30); *Mitrlula serpentina*—33 (xi, 268*); 7 (249). Exs.: Cooke, 'Fung. Brit.', Ed. 2, 395; 43 (No. 54). On the ground amongst moss, leaves, etc.
- Trichoglossum hirsutum** (Pers. ex Fr.) Boud. 28 (iv, 370; xv, 117, morphology); 33 (xi, 241*); 115 (20); 102 (vi, 436); *Geoglossum*—Ramsbottom, Handbk., 184; 117 (lii, 386); 109 ('1876', publ. 1880, 228); 7 (248); 27 (i, 189); 8 (iv, 492); 40 (iv, n.s., 130); 11 (34*); 41 (pl. 1, fig. 3*); 15 (663); 18 (362*); Proc. Somersetsh. archaeol. nat. Hist. Soc. (iii, 145); 39 (iv, pl. 185*); 51 (416); 120 (i, 658); 20 (178); *Clavaria ophioglossoides*—42 (pl. 83*, 1797); 38 (Ed. 5, iv, 435); *Geoglossum hirsutum* var. *capitatum*—92 (ii, 30). Amongst grass on damp ground.

LEOTIACEAE

- Apostemidium aridula** Karst. 28 (ix, 5, 1923); 105 (lxi, 383); *Gorgoniceps*—Nannfeldt, Inop. Disc., 313, suggests that this belongs to Helotiaceae. In woods around Bassen-thwaite, Cumberland.
- Guernisaci** (Cr.) Boud. 28 (iv, 371; x, 130); 115 (20); 108 (viii, Appendix, 112); Boudier, Icones, pl. 433†; 102 (vi, 456); *Gorgoniceps*—7 (287); *Vibrissea*—36 (xxxii, 465); Glasg. Nat. (i, 114); 8 (iv, 488); 40 (iv, n.s., 185); 11 (319*); 45 (ii, 8*); 13 (298); 14 (iv, 120, 1875). Exs.: 43 (No. 143). On dead submerged branches of willow, alder, etc.
- leptospora** (B. & Br.) Boud. 28 (iv, 371); 115 (20); *Vibrissea*—33 (xi, 299); 27 (xxiii, 134); 40 (iv, n.s., 185); 11 (320); 45 (ii, 8*); *Peziza*—13 (318); 15 (696); Berkeley & Broome in 19 (xviii, No. 1166, with fig., 1866); *Vibrissea Guernisaca* var. *leptospora*—8 (iv, 488, p.p.). On decayed wood.
- micrometra** (B. & Br.) Boud. 28 (iv, 371); *Mollisia*—8 (iv, 221, as 'doubtful'); 11 (184); *Peziza*—15 (705); 18 (371); Berkeley & Broome in 19 (xiii, No. 773, 1854). On dead stems of *Juncus* spp.
- vibrisseoides** (Peck) Boud. 28 (iv, 371; vii, 296); 102 (iv, 240, morphology; vi, 457); *Vibrissea Guernisaci* var. *vibrisseoides*—8 (iv, 488); *Vibrissea turbinata*—Phillips in 45 (ii, 8*, 1881); 11 (320). On dead branches of ash in water-courses.
- Cudonia circinans** (Pers. ex Fr.) Fr. 28 (iv, 370); Nannfeldt, Inop. Disc., 316; Ramsbottom, Handbk., 185; 115 (20); Boudier, Icones, pl. 430†; 102 (vi, 458); 8 (iv, 473); *Leotia*—11 (24*); 41 (pl. 44, fig. 172*); 13 (297); 19 (xvii, No. 1617); 65 (xii, 274, 1875); 40 (ii, 362, 1874; iv, n.s., 129); *Vibrissea*—33 (xi, 261*); 7 (249). Among moss, etc., in woods, sometimes growing in circles.
- confusa** Bres. 28 (ii, 168, 1907; iv, 12 & 370); Trans. Perthsh. Soc. nat. Sci. (vii, 13); Boudier, Icones, pl. 431*. Under beech trees, near *Tsuga canadensis*, Dunkeld.
- Cudoniella acicularis** (Bull. ex Fr.) Schroet. 28 (iv, 370); 115 (20); *Leotia*—8 (iv, 472); 11 (25); 40 (iv, n.s., 129); *Peziza*—13 (328); 18 (371); 20 (208); *Helvetia*—Ramsbottom, Handbk., 190; 27 (xvii, 364); 15 (708); 20 (i, 660); 7 (282); *Helvetia agariciformis*—55 (Appendix iv, 451); 42 (pl. 57*); 38 (Ed. 2, iii, 430); 111 (iii, pl. 98, fig. 1); Relham, Fl. Cantab. (i 175, 1785); *Leotia Queletii*—41 (pl. 102, fig. 369†); *Fungus minimus*—Ray, Syn. (p. 9, 1689). Exs.: Cooke, 'Fung. Brit.', No. 400. On decaying stumps in moist, shady places.

Cudoniella Allenii A. L. Smith in 28 (iii, 40, 1908; iv, 370). Nannfeldt in 28 (xx, 194) considers that the type specimen is *Corynella atro-virens* (Pers.) Boud. On rotten wood.

[**Leotia atra** Weinm. 33 (xi, 301, 1897). Generally excluded owing to insufficient data.

— **atro-virens** Pers. ex Fr. 28 (iv, 370); 115 (20); Boudier, Icones, pl. 429†; 41 (pl. 102, fig. 368†); *Leotia chlorocephala*—Ramsbottom, Handbk., 185; 102 (vi, 450); 8 (iv, 471); 11 (23); 40 (iv, n.s., 129); 19 (ix₅, No. 1985); 41 (pl. 44, fig. 174†); *Leotia lubrica* var. *chlorocephala*—33 (xi, 290); *Leotia chlorocephala* var. *Stevensoni*—7 (250); 8 (iv, 472); 11 (24); *Leotia Stevensoni*—19 (iii₅, No. 1827, 1879); 13 (297). On damp ground in woods.

[— **infundibuliformis** Fr. 33 (xi, 300, 1897). Generally excluded owing to insufficient data.

— **lubrica** [Scop.] Pers. ex Fr. 28 (iv, 370; x, 234); 115 (20); Rev. mycol. (ix, n.s., 3–13, ascus structure); Ramsbottom, Handbk., 185; 102 (vi, 446); Bot. Gaz. (L, 443, cytology); 7 (250); 27 (xvii, 363); 33 (xi, 287*); 8 (iv, 471); 11 (22); 40 (iv, n.s., 128); 15 (661*); 70 (i, n.s., 297); 41 (pl. 44, fig. 171*); 46 (ii, pt. 1, 216); 18 (360*); 20 (186); 58 (154); 51 (417); 39 (i, pl. 56*); 120 (i, 660); *Leotia gelatinosa*—102 (iv, 222, morphology); Hill, Hist. of Pl. (43, 1751); *Helvella gelatinosa*—55 (Appendix, iii, 259); 42 (pl. 70*); 38 (Ed. 3, iv, 339); Relhan, Fl. Cantab. (Ed. 3, p. 551). Exs.: Cooke, 'Fung. Brit.', No. 231; Berkeley, 'Brit. Fung.', No. 255; 43 (No. 136). On the ground in woods.

[— **nana** With. ex Fr. 28 (iv, 370); 33 (xi, 300); 11 (26); 18 (360); 20 (185); *Helvella*—Withering in 38 (Ed. 3, iv, 338, 1796). Generally excluded owing to insufficient data. Recorded by Withering amongst moss under trees, Pendarvis, Cornwall and not since.

Mitruia alba W. G. Smith in 14 (i, 136*, 1873); 28 (iv, 370); Ramsbottom, Handbk., 183; 11 (29); 41 (pl. 45, fig. 177*, from W. G. Smith's drawings); *Mitruia phalloides* var. *alba*—8 (iv, 482); *Mitruia laricina* var. *alba*—33 (xi, 273). Among submerged leaves.

— **cucullata** Batsch ex Fr. 28 (iv, 370); Ramsbottom, Handbk., 183; 115 (20); 102 (vi, 402); 7 (250); 8 (iv, 482); 70 (i, n.s., 297); 33 (xi, 276*); 11 (27); 40 (iv, n.s., 129); 13 (296); 15 (660); 41 (pl. 45, fig. 176*); 18 (360); 27 (L, 189); *Geoglossum*—20 (179); *Leotia Mitruia*—51 (416); 39 (ii, pl. 81*); *Clavaria ferruginea*—42 (pl. 84*, 1797); *M. Heyderi* Pers.—Nannfeldt, Inop. Disc., 315. Among fallen needles of conifers.

— **microspora** (Cooke & Peck) Mass. 28 (iv, 370); 7 (250); 8 (iv, 483); 33 (xi, 281*); *Leptoglossum*—Ramsbottom, Handbk., 184; *Geoglossum*—46 (iv, n.s., 149, 1884); 40 (1895, 55); 41 (pl. 3, fig. 11†); 11 (39); *Corynetes*—Nannfeldt, Inop. Disc., 316; *Geoglossum Hookeri*—41 (pl. 4, fig. 15*); *Geoglossum atropurpureum*—41 (pl. 4, fig. 16†); *Corynetes atropurpureus*—102 (vi, 414); *Geoglossum purpurascens*—33 (xi, 266). On the ground, in scorched places, among grass, under bracken, etc.

— **phalloides** [Bull.] Chev. 28 (iv, 370); 48 (xxvi, 55); 115 (20); Boudier, Icones, pl. 427†; 102 (vi, 400); 8 (iv, 481*); *M. paludosa*—Ramsbottom, Handbk., 183; 27 (xvii, 363); 7 (250); 11 (28*); 40 (iv, n.s., 129); 14 (iii, 124); 41 (pl. 45, fig. 175*); 15 (660*); 8 (360); 20 (180); *M. laricina*—33 (xi, 271*); *Leotia uliginosa*—39 (vi, 312); 51 (416); *Leotia epiphylla*—92 (ii, 30); *Clavaria epiphylla*—44 (22, fasc. 3); 38 (Ed. 3, iv, 360, 1796); 42 (pl. 293). On decayed leaves in damp places.

— **sclerotipus** Boud. 28 (iii, 378, 1912; iv, 12; xix, 287); Trans. Perthsh. Soc. nat. Sci. (vii, 13); Boudier, Icones, pl. 428†; 41 (pl. 102, fig. 370†). On boggy ground.

Pilacre pallida (Pers. ex Fr.) Boud. 28 (iv, 371); 115 (21); *Roesleria*—33 (xxx, 405); *Roesleria hypogaea* Thüm. & Pass.—112 (151); Morots' J. Bot. (ii, 263); Nannfeldt, Inop. Disc. (315, taxonomy); *Coniocybe pallid*—Viennot-Bourgin, Les champ. parasites, 1, 664*. On dead roots.

Spathularia clavata [Schaeff.] Sacc. 28 (iv, 370); 115 (20); 7 (249); 8 (iv, 485*); Glasg. Nat. (i, 33); 33 (xi, 254*); 102 (iv, 220, anatomy); 70 (i, n.s., 297); *Helvella*—38 (Ed. 3, iv, 340); *Spathularia flavida*—Ramsbottom, Handbk., 183; 11 (30*); 40 (iv, n.s., 130); 13 (297); 15 (661*); 27 (xvii, 363); 109 ('1874', publ. 1880, 43); 41 (pl. 95, fig. 342*); 18 (360*); Proc. Somerseth. archaeol. nat. Hist. Soc. (vi, 145); 39 (iii, pl. 165*); 20 (i, 663); 92 (ii, 30); *Helvella spatulata*—55 (Appendix iv, 452); 42 (pl. 35*); *Clavaria spathula*—38 (Ed. 2, iii, 450); Relhan, Fl. Cantab., Ed. 3,

562; 44 (fasc. I, 21, 1785); *Helvella feritoria*—111 (III, pl. 97*). On the ground among moss, fir leaves, etc., in damp woods.

- Vibrissea Fergussoni** B. & Br. 28 (IV, 370); 11 (318); 40 (IV, n.s., 185); 45 (Ser. 2, II, 7*); *Psilopezia*—13 (334); *Patellaria*—14 (III, 123); Berkeley & Broome in 19 (xv, No. 1490, with fig., 1875); as *Vibrissea Guernisaci* var. *leptospora*—8 (IV, 488, p.p.). On *Prunus Padus*.
- **microscopica** B. & Br. 28 (IV, 370); 36 (XXXI, 465); 8 (IV, 489); 11 (319); 40 (IV, n.s., 185); 45 (Ser. 2, II, 7*); 13 (298); 14 (V, 59); Berkeley & Broome in 19 (xvii, No. 1618, 1876); *Gorgoniceps*—33 (XI, 298). On damp fir wood.
- **truncorum** [Alb. & Schw.] Fr. 28 (IV, 370); 115 (20); Nannfeldt, Inop. Disc., 79; 7 (249); Boudier, Icones, pl. 432†; 102 (VI, 452†, structure); 33 (XI, 260*); 8 (IV, 487*); Glasg. Nat. (I, 113); 11 (316*); 40 (IV, n.s., 184); 45 (II, 5*); 13 (298); 14 (III, 124); 15 (662*); 18 (361); 20 (186); 19 (XII, No. 305*, 1844); *Vibrissea Margarita*—White in 40 (II, 218, 1874; IV, n.s., 184); 11 (317); 45 (II, 6); 13 (298); 19 (xv, No. 1477); 14 (II, 162); 35 (60, 1875). On dead sticks in wet places.

OMBROPHILACEAE

- Calycella citrina** (Hedw. ex Fr.) Quél. 28 (IV, 371); 115 (21); Boudier, Icones, pl. 441†; *Helotium*—115 (23); 71 (XXVIII, 133; XXXI, 13), 15); 70 (I, n.s., 298); 27 (xvii, 364); 102 (IV, 229, anatomy and morphology); 7 (280); 8 (IV, 238); 40 (IV, n.s., 141); 11 (157); 15 (712); 18 (372); *Peziza*—Proc. Belfast Nat. Fld Cl. (Appendix 1884, 310); Ann. Mag. nat. Hist. (v, 1840, 5); 20 (II, 202); 58 (150); 51 (423); 42 (pl. 151); 38 (Ed. 3, IV, 347, 1796); *Octospora*—Hedwig, Laub. Moose (II, pl. VIII B†). Exs.: 43 (No. 41). On rotten wood, stumps, dead cabbage stalks, etc.
- **claroflava** (Grev.) Boud. 28 (IV, 371); 115 (21); *Helotium*—115 (23); 71 (XXVIII, 133; XXXI, 13), 15); Proc. Hampshire Fld Cl. (1910, 339); 7 (279); 106 (IV, 219); 8 (IV, 233); 40 (IV, n.s., 142); 11 (165*); 65 (XII, 281); 15 (713); 18 (372); *Peziza*—20 (203); Greville in 51 (423, 1824). Nannfeldt in 28 (xx, 193), states that the specimens in the Herb. B.M. and Herb. Kew, are *Calycella citrina* Hedw. ex Fr. in young state. On decayed wood and branches, dead holly leaves.
- **Fergussoni** (Sacc.) Boud. 28 (IV, 371); 115 (21); *Helotium melleum* B. & Br.—36 (XXXI, 478); 7 (282); 8 (IV, 242); 40 (IV, n.s., 141); 11 (160); 13 (332); Berkeley & Broome in 19 (xv, No. 1487, 1875). On rotten wood, branches and on the ground.
- **ferruginea** (Schum. ex Fr.) Boud. 28 (IV, 371); 115 (21); 71 (XLIB, 51, first record for Ireland); *Helotium*—115 (23); 7 (280); 8 (IV, 236); 11 (154*); 15 (715); 19 (VII, No. 962, 1861). On dead wood.
- **flava** (Klotzsch in Sched.) Boud. 28 (IV, 371); 115 (21); 71 (XLB, 51, first Irish record); *Helotium*—115 (23); 7 (281); 8 (IV, 241); 11 (156); 46 (III, n.s., 137*, 1881). Nannfeldt in 28 (xx, 194), and in notes in Herb. B.M. considers that the type represents an old specimen of *Calycella citrina* (Hedw. ex Fr.) Quél., collected in winter after frost. On decorticated wood and on dead branches.
- **Humuli** (Lasch) Boud. 28 (IV, 371); *Helotium*—8 (IV, 256); 11 (167, 1887). On dead stems of *Humulus Lupulus*.
- **Ilicis** (Phill.) Boud. 28 (IV, 371); *Helotium*—8 (IV, 260); Phillips in 11 (164, 1887); *Helotium epiphyllum* var. *Ilicina*—43 (No. 134). This is *Helotium punctiformis* q.v. according to White in Farlowia (I, 160). On dead leaves of holly.
- **lenticularis** (Bull. ex Fr.) Boud. 28 (IV, 371); 115 (21); *Helotium*—28 (XII, 294, a four-spored form on apple-pulp); 71 (XXVIII, 133); 7 (280); 8 (IV, 236); 40 (IV, n.s., 141); 11 (157); 15 (712); 18 (372); Proc. Belfast Nat. Fld Cl. (Appendix 1884–5, 310); Ann. Mag. nat. Hist. (v, 1840, 5); *Peziza*—20 (II, 203); ? = *Peziza aurea*—55 (1817, 689; Appendix IV, 464). On old stumps, dead wood, rotten branches.
- **ochracea** Boud. 28 (XIII, 259, 1928); Boudier, Icones, pl. 442†. On decorticated wood, Weybridge; on *Corylus* stump, Bransford, Worcs.
- **pallesens** (Pers. ex Fr.) Quél. 28 (IV, 371); 115 (21); *Helotium*—40 (IV, n.s., 141); 11 (158); 27 (xvii, 364); 15 (712); 18 (372); *Peziza*—20 (II, 203, 1836); *Helotium citrinum* var. *pallesens*—7 (281); 8 (IV, 239). On dead wood, stumps, and on 'living sycamore root branch'—7 (281).
- **sublenticularis** (Fr.) Boud. 28 (IV, 371); 115 (21); *Helotium*—115 (23); 27 (I, 192); 7 (283); 8 (IV, 249, 1895). On birch bark and old stumps.

- Calycella subsessilis** (Schum.) Boud. 28 (iv, 371); *Helotium*—8 (iv, 270, 'doubtful species'); 11 (158); 15 (714); 18 (372); as *Peziza helotioides* Fr.—19 (vii₂, No. 573 1851). On dead branches and wood.
- **uliginosa** (Fr.) Boud. 28 (iv, 371); 115 (21); *Helotium*—27 (I, 191, 1912); 7 (282); 8 (iv, 244); *Hymenoscypha*—14 (xvii, 45, 1888). On dead branches of willow, birch, alder, ash, etc.
- Discinella Boudieri** (Quél.) Boud. var. **spadicea** Boud. In Herb. B.M., collected and named by W. D. Buckley. Under *Spartium junceum* at Burnham Beeches, 4 Nov. 1925.
- **exidiiformis** (B. & Br.) Boud. 28 (iv, 371); Trans. Perthsh. Soc. nat. Sci. (vii, 15); *Humaria*—8 (iv, 418); *Peziza*—36 (xxxI, 501); 40 (iv, n.s., 133); 11 (81); 13 (306); 41 (pl. 15, fig. 60*); Berkeley & Broome in 19 (xv₄, No. 1480, 1875); ? = *Discinella badicolor* Boud.—28 (iv, 371). Nannfeldt in 28 (xx, 195), states that *D. exidiiformis* is an operculate form, probably belonging to *Humarina* Seaver. On silver sand, rotten wood and charcoal heaps.
- **margarita** Buckley in 28 (vi, 346, 1920). On the ground, among moss, Slough.
- **Menziesi** (Boud.) Boud. 28 (iv, 323 & 371; vi, 346); 27 (Lii, 216); Trans. Perthsh. Soc. nat. Sci. (vii, 15); *Calycella*—Boudier in 28 (iv, 62*, 1913); *D. 'Meurisi'* Boud.—117 (xxxiii, 17). On sandy earth, Perth.
- **minutissima** Ramsb. & Garn. in 27 (Lii, 216, 1914); 28 (v, 158). On sandy and clay ground, Silchester.
- **purpurascens** (Pers. ex Fr.) Boud. 28 (iv, 371); *Humaria*—8 (iv, 419); *Peziza*—11 (77); 41 (pl. 72, fig. 276*); 14 (v, 60, 1876); ? = *Discinella Boudieri* Quél.—Boudier (1907, 96); Boudier, Icones, pl. 445†. Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 543. On the ground in autumn.
- Melachroia terrestris** (Niessl.) Boud. 28 (iv, 371); *Phacidium*—8 (iv, 58); 14 (xviii, 86, 1890). On damp ground among decaying leaves.
- **xanthomela** (Pers. ex Fr.) Boud. 28 (iv, 371); Boudier, Icones, pl. 449†; *Humaria*—8 (iv, 416); *Peziza*—40 (vi, 122, 1881; iv, n.s., 134); 11 (97); 41 (pl. 11, fig. 41†); 14 (iii, fig. 86†). Among decayed pine leaves and larch wood and on the ground.
- Ombrophila Alniella** (Nyl.) Karst. 28 (ii, 35; iv, 371; v, 47); 1 (ii, 129); 115 (21); 106 (xxvii, 36); *Helotium*—115 (23); 28 (iii, 302); 7 (286); 8 (iv, 262); 40 (iv, n.s., 141); 11 (155); *Peziza*—40 (vi, 124, 1881); *Helotium Grenseri*—40 (vi, 124, 1881). Imperfect stage is *Acleistia Alniella* Bayliss-Elliott in 28 (v, 420). On fallen catkins of *Alnus glutinosus*.
- **clavus** (Alb. & Schw. ex Fr.) Cooke 28 (iv, 371); 115 (21); 71 (xxviii, 133); 7 (300); 8 (iv, 142*); 40 (iv, n.s., 185); 46 (vi, n.s., 33); 11 (342); *Peziza*—13 (322); 15 (700); 18 (370); 19 (vii₂, No. 575, 1851). On branches, leaves and grass in damp places.
- **decolorans** (Berk. & Curtis) Massee 115 (21); 35 (22 & 30, 1902); 7 (300); 45 (xxxI, 466†); 28 (ii, 35). On decaying stumps.
- **faginea** (Pers. ex Fr.) Boud. 28 (iv, 371); 115 (21); *Helotium*—115 (23); 70 (i, n.s., 298); 71 (xxviii, 133); 7 (285); 8 (iv, 261); 40 (iv, n.s., 141); 11 (159); 15 (715); 27 (xvii, 364); 19 (vii₃, 963*); 18 (372); *Peziza*—20 (ii, 204); 58 (ii, 150, 1830). On decayed straw, beech mast, hazel-nut shells, etc.
- **helotioides** Rehm 28 (iv, 371); Rehm in Hedwigia (1899, 243). References to British records not found. On decaying needles of *Abies pectinata*.
- **imberbis** (Bull. ex Fr.) Boud. 28 (iv, 371); 115 (21); *Helotium*—7 (280); 8 (iv, 235); 71 (xxviii, 133); 40 (iv, n.s., 142); 11 (164); *Peziza*—13 (320); 15 (699); 19 (xviii, No. 1167, 1866); *Helotium imberbe* var. *sessile*—19 (vii₃, No. 963, 1861). On willow and alder.
- **megalospora** Rea in 28 (v, 256, 1916); Trans. Perthsh. Soc. nat. Sci. (vii, 14). On dead leaves of *Carex inflata* in a pool, Inver, Perthshire.
- **nigripes** (Pers. ex Fr.) Boud. 28 (iv, 197, 1913; iv, 371); Trans. Perthsh. Soc. nat. Sci. (vii, 14). On dead needles of conifers, near Perth.
- **rudis** (Berk.) Phill. 28 (iv, 371); 115 (21); 7 (300); 8 (iv, 142); 54 (iv, 731); 40 (iv, n.s., 185); 11 (322); *Peziza*—13 (318); 15 (695); 18 (370); 19 (vii₂, No. 574, with fig.); Berkeley in Hist. Berwicksh. Nat. Cl., Berwick-on-Tweed (ii, 190, 1847). On shallow gravel and peat.
- **verna** Boud. 28 (vi, 328, 1920); Boudier, Icones, pl. 435†. On *Sphagnum* and dead grass haulms near Glasgow.

- Ombrophila viridifusca** (Fuckel) Rehm 28 (v, 418, 1917). On alder catkins, Tanworth-in-Arden.
- Pachydisca agaricina** (Berk.) Boud. 28 (iv, 371); *Belonidium*—8 (iv, 224); *Helotium*—40 (iv, n.s., 171); 11 (170); 15 (708); 18 (371); *Peziza*—Carmichael MSS. in 20 (ii, 207, 1836). Nannfeldt states that this is *Corynella atrovirens* (Pers.) Boud. On decayed wood.
- **badia** (Phill.) Boud. 28 (iv, 371); 115 (21); *Helotium*—7 (280); 8 (iv, 234); 11 (167); Phillips in 14 (xv, 113, 1887). According to Nannfeldt in 28 (xxiii, 247), this is the same as *Helotium salicellum* Fr. On dead willow twigs, etc.
- **belonea** Crouan 28 (xiii, 259, 1928). On and amongst *Polytrichum*, Epping Forest, Essex.
- **brunnea** (Phill.) Boud. 28 (iv, 371); 115 (21); *Ombrophila*—71 (xxviii, 133); 28 (iii, 291); 7 (300); 8 (iv, 143); 40 (iv, n.s., 185); 11 (323); Phillips in 14 (viii, 103, 1880); *Peziza*—40 (i, n.s., 87). Nannfeldt in 28 (xx, 200), suggests that this is *Humaria*. On herbaceous stems in damp places.
- **fibuliformis** (Bolt. ex Fr.) Boud. 28 (iv, 371); 115 (21); *Helotium*—7 (286); 8 (iv, 270, 'doubtful species'); 40 (iv, n.s., 141); 11 (156); 15 (707); 18 (371); *Peziza*—20 (ii, 207); *Helvella*—38 (Ed. 2, iii, 431); Bolton in 111 (pl. 176*, 1791); *Hymenoscyphus fibulaeformis*—120 (i, 673). Nannfeldt in 28 (xxiii, 247), states that no authentic material exists and that the description suggests *Vibrissea truncorum* A. & S. ex. Fr. On sticks and elm root near stream.
- **fusisporum** (Schroet.) Boud. 28 (iv, 324, 1914). On birch bark, Earlswood, near Birmingham.
- **helotioides** (Phill.) Boud. 28 (iv, 371); *Ombrophila*—Phillips in 14 (xvi, 94, 1888); 8 (iv, 142); 40 (iv, n.s., 186 & 223). Described as growing on dead stems of *Equisetum* in water, near Aberdeen, but examination of type specimen shows that the host is a flowering plant.
- **immutabilis** (Fuckel) Boud. 28 (iv, 371); 115 (21); *Helotium*—115 (23); 7 (285); 8 (iv, 259); 11 (162, 1887); Farlowia (i, 145†). On fallen leaves of poplar and oak.
- **Laburni** (B. & Br.) Boud. 28 (iv, 371; vi, 14; xx, 200 identical with *Helotium infarciens*); 115 (21); *Helotium*—7 (280); 8 (iv, 235); 36 (xxxi, 475); 13 (332); 14 (v, 62); Berkeley & Broome in 19 (xvii, No. 1624, 1876); *Hymenoscypha*—40 (iv, n.s., 138); 11 (135). On decorticated branches of *Cytisus Laburnum* and on *Corylus*.
- **Marchantiae** (Berk.) Boud. 28 (iv, 371); 115 (21); *Helotium*—7 (286); 8 (iv, 267); 40 (iv, n.s., 142); 11 (164); 15 (715); 18 (372); *Peziza*—Berkeley in 20 (ii, 204, 1836); 36 (xxxi, 507*). On fading *Marchantia*.
- **Marchantiae** var. **conocephali** (Boyd) Ramsb. 28 (iv, 371); *Helotium*—Trans. Buteshire Nat. Hist. Soc. (vi, 84); 28 (iii, 113); Boyd in Glasg. Nat. (i, 112, 1909); as *Helotium marchantiae*—Trans. nat. Hist. Soc. Glasg. (iii, n.s., 272); Handbk. of Fauna and Flora of Clyde Area (1901, 67). On *Conocephalus conicus*.
- **ochracea** (Grev.) Boud. 28 (iv, 371); 115 (21); *Helotium*—115 (23); 7 (280); 8 (iv, 237); 40 (iv, n.s., 142); 27 (xvii, 364); 11 (169); 15 (713); 18 (372); *Peziza*—20 (ii, 204); Greville in 39 (pl. 5*, 1823); 51 (425). According to Nannfeldt, 28 (xx, 200), this is apparently a *Pezicula* judging from Greville's drawings and description; the type is lost. On fallen trunks and branches, etc.
- **quisquilaris** (Phill.) Boud. 28 (iv, 371; xx, 200, Nannfeldt states that no such species was ever described. Boudier's reference, 'quisquilaris Phill., Grevillea, xvi, 94, and Sacc. Syll., viii, 617', being a mixture of *Helotium quisquiliaris* Karst. and *Ombrophila helotioides* Phill.)
- [— **sclerotoides** (Berk.) Boud. 28 (iv, 371); *Helotium*—8 (iv, 271); 40 (iv, n.s., 171); 11 (170); 15 (708); 18 (371); Berkeley in 20 (ii, 208, 1836). According to Nannfeldt in 28 (xxiii, 247), this is not a Discomycete but a Sclerotium. On decayed wood.
- **scoparia** (Cooke) Boud. 28 (iv, 371); *Helotium*—8 (iv, 234); 40 (iii, 201; iv, n.s., 142); 11 (168); 13 (332); Cooke in 14 (iv, 111, 1876). Nannfeldt in 28 (xx, 201), states that the type at Kew is typical *Pezicula Rubi* (Lib.) Niessl. On dead twigs of broom.

BULGARIACEAE

- Ascotremella faginea** (Peck) Seaver 28 (xxix, 152, 1946¹): Nannfeldt, Inop. Disc., 310. On dead wood, West Dean Wood, Sussex.
- Bulgaria inquinans** [Pers.] Fr. 28 (iv, 372): Ramsbottom, Handbk., 190; 115 (21); 70 (xxi, n.s., 401); Rev. mycol. (v, n.s., 87, 101, structure of ascus and spores); 117 (xxx, 361, ascospore dimorphism); 40 (iv, n.s., 184); 11 (314¹); 13 (339); 15 (732); 18 (375*); *Peziza*—33 (xv, 119, biology, spore dimorphism); 92 (ii, 321); *Phaeobulgaria*—Nannfeldt, Inop. Disc., 311¹; *Bulgaria polymorpha*—93 (219); 34 (iv, 20, facultative parasite); 112 (150); 62 (xiv, 122); 27 (1, 192); 56 (xxvi, 503, biology; xxix, 805, spore germination); 117 (iii, 41, chemistry); 71 (xxviii, 134; xxxib, (13), 15); 5 (287); 7 (302); 8 (iv, 140); *Peziza polymorpha*—55 Appendix iv, 464); 55 (1817, 689); 42 (pl. 428*); 38 (Ed. 2, iii, 444¹); 95 (ii, 1055, 1789; Abbot, Fl. Bedf. (No. 1130, 330, 1798); *Peziza tubinata*—Relhan, Fl. Cantab. 467, 1785); *Tremella turbinata*—Hudson, Fl. Anglica (Ed. 2, 563, 1778; *Peziza nigra*—58 (1831, 148). On logs and fallen branches of trees.
- Bulgariella pulla** (Fr.) Karst. 28 (iv, 372): Nannfeldt, Inop. Disc., 311; 115 (21); Glasg. Nat. (i, 35); 7 (303); 8 (iv, 141*); *Bulgaria*—11 (315); 46 (iv, n.s., 149, 1884). On rotten wood.
- Coryne aquatica** Mass. & Crossland in 35 (355, 1902, mentioned; 6, 1904¹; 7 (302); 115 (21); 28 (ii, 94; iv, 372). Among moss at water level, Egton Bridge, near Whitby.
- **sarcoides** (Jacq. ex Fr.) Tul. 28 (iv, 371); 115 (21); 7 (302); 71 (xxviii, 133; xxxib, (13), 6); 27 (1, 192); *Bulgaria*—Proc. Belfast Nat. Fld. Cl. Appendix 1884-5, 310); 15 (733); 18 (375*); 20 (ii, 210); Ann. Mag. nat. Hist. v, 5¹; *Ombrophila*—40 (iv, n.s., 185); 11 (323); *Peziza*—51 (423¹); *Tremella*—92 (ii, 321); 38 (Ed. 3, iv, 78); *Helvella*—38 (Ed. 2, iii, 431); 111 (iii, pl. 101, fig. 2*); 44 (Fasc. 1, 21, 1785). Exs.: 43 (No. 138); Cooke, 'Fung. Brit.', Ed. 1, No. 482. On trunks and branches.
- **urnalis** (Nyl.) Sacc. 28 (iv, 372); 115 (21); 71 (xxxib, (13), 15; xlii, 51); 27 (xlv, 170, variations in ascospore numbers: 1, 192¹; Boudier, Icones, pl. 450¹; 7 (302); 8 (iv, 153); *Ombrophila purpurea*—35 (1891, 20); 11 (324); *Bulgaria purpurea*—35 (n.s., i, 60); *Bulgaria purpurea*—14 (ii, 163, 1874¹). On rotten wood, trunks, etc., on decaying acorn.

CALLORIACEAE

- Agyrium rufum** Pers. ex Fr. 28 (iv, 372; xxxi, 301, as a lichen); 8 (iv, 150*); 65 (xii, 282); 13 (340); 15 (733*); 18 (375); 20 (ii, 220¹); 39 (pl. 232, 1826¹; including var. *pallens* Fr.—8 (iv, 150). On old dry wood, especially fir, also associated with lichens.
- Calloria conicola** Cooke & Phill. 28 (iv, 372); 8 (iv, 152); Phillips & Cooke in 11 (333, 1887). Nannfeldt, 28 (xx, 192), suggests that this is a *Lecanum*, inseparable from *L. brevipilum* v. Hoehn.; also v. *Urecolella Berkeleyi* and *Transpeziza Grevillei*. On dead stems of *Conium maculatum*.
- **cornea** (B. & Br.) Phill. 28 (iv, 372); 115 (22); 7 (302); 8 (iv, 152); 11 (332); *Peziza*—15 (704); 18 (371); Berkeley & Broome in 19 (vii, No. 378, 1831). In 28 (xx, 193), Nannfeldt states that this should be *Melasma cornea* B. & Br. v. Hoehn. On dead stalks of *Carex* spp.
- **extumescens** Karst. 28 (vi, 14, 1919; vi, 266, 1920). On decaying oak, Bomere, near Shrewsbury.
- **fusarioides** (Berk.) Fr. 28 (iv, 372); 115 (22); Nannfeldt, Inop. Disc., 192; 71 (xxviii, 134; xxxib, (13), 6); 27 (1, 192); 7 (302); 8 (iv, 151); 114 (iii, 195¹); 40 (iv, n.s., 186); 11 (331); *Peziza*—Proc. Belfast Nat. Fld. Cl. Appendix 1884-5, 310¹); 13 (323); 15 (704); 18 (371); 19 (i, No. 12, with fig.; *Fusarium tremulicoides* Grev.—20 (ii, 355); 39 (i, pl. 10, 1823). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 342; Berkeley, 'Brit. Fung.', No. 67; 43 (No. 82). On dead nettle stems.
- Corynella atro-virens** (Pers. ex Fr.) Boud. 28 (iv, 372); 115 (21); *Coryne*—7 (302); 8 (iv, 154*); *Ombrophila*—40 (iv, n.s., 186); 11 (325); *Peziza*—13 (322); 15 (701); 18 (370); 20 (ii, 205); 51 (425, 1824). On decaying wood.
- **glabro-virens** Boud. 28 (iii, 303 & 379, 1912; iv, 372). Boudier, Icones, pl. 458¹; 71 (xxxib, (13), 15, 25, 1912; xlii, 51¹). On dead wood, among decaying leaves.

- Corynella prasinula* (Karst.) Boud. 40 (34, 1947). On *Fagus*.
- Habrostictus lasia* (B. & Br.) Boud. 28 (iv, 372; xx, 195; Nannfeldt regards this as *H. rubra* Fueki); *Orbilia*—8 (iv, 146); *Calloria*—11 (327); *Peziza*—Berkeley & Broome in 19 (xi, No. 1391, with fig., 1873); 14 (i, 162). On bark and wood of elm.
- Hyalinia albella* (Wuth.) Boud. 28 (iv, 372); 115 (22); *Pseudopeziza*—8 (iv, 202; 7 (294); 115 (29); *Peziza albidula*—38 (Ed. 2, iii, 446, 1792, not *P. albella*); 28 (xxiii, 244; *Mollisia vulgaris*—14 (xxiii, 83); 13 (323); 15 (703); 18 (371); 20 (ii, 206); Boudier, 1907, states that *H. albella* and *H. vulgaris* are synonyms. On decaying branches of hazel, sweet chestnut, etc.
- auricolor* (Blox. ex Berk.) Boud. 28 (iv, 372); 115 (22); *Orbilia*—71 (xxxviii, 134; 7 (301); 8 (iv, 148); 28 (xxiii, 244; *Orbilia inflatula* is a synonym); *Calloria*—11 (334); *Peziza*—15 (704); 19 (xv, No. 1000, 1869, Blox. MS.). On fallen trees, dead wood.
- dilutella* (Fr.) Boud. 28 (iv, 372); 115 (22); *Mollisia*—115 (26); 7 (291); 8 (iv, 212; 54 (iv, 731); 46 (vi, n.s., 193; 11 (191*, 1887). On dead stems of *Epilobium hirsutum*.
- dilutella* var. *Smyrni* (Pank.) Boud. 28 (iv, 372); *Mollisia*—11 (192, 1887); *Mollisia digitalina* var. *Smyrni*—8 (iv, 212). On dead stems of *Smyrni*.
- incarnata* (Cooke) Boud. 28 (iv, 372; xx, 204; *Mollisia*—8 (iv, 216); 40 (iv, n.s., 173); 11 (191); *Peziza*—13 (324); Cooke in 14 (i, 131, 1873). Nannfeldt, 28 (xx, 195), regards this as *Pseudohelotium Puzh* (Bauk. ex Fr.) Fueki. On pine leaves.
- inflata* (Karst.) Boud. 28 (iv, 372); 115 (22); *Orbilia*—Nannfeldt, Inop. Disc., 254†; 71 (xxxix, 13); 15; 7 (301); 8 (iv, 146*); 14 (xxii, 44; *Calloria*—11 (335); *Peziza*—14 (x, 66; 46 (vi, n.s., 67, 1886). On bark and wood, and on *Angelica* stems.
- Leightoni* (Phill.) Boud. 28 (iv, 372); *Orbilia*—8 (iv, 148; *Calloria*—Phillips in 11 (329, 1887). On *Polyporus*.
- Leightoni* var. *lignicola* Elliott in 28 (vi, 14, 1919; vi, 266, 1920). On decaying wood, Plowden, near Shrewsbury.
- rubicola* (Cooke & Phill.) Boud. 28 (iv, 372); *Orbilia*—8 (iv, 146); *Calloria*—Cooke & Phillips in 11 (331, 1887). On *Rubus cassius*.
- subdiaphana* [Sow.] Boud. 28 (iv, 372; *Peziza*—Sowerby in 42 (pl. 389, fig. 7*, 1869; *Calloria diaphana*—71 (xxxviii, 134; 11 (335). On fallen branches.
- succinea* (Fr.) Boud. 28 (iv, 372); 115 (22); *Orbilia*—37 (1909, 375); 7 (301); 8 (iv, 493; *Peziza*—38 (Ed. 1, ii, 775, 1776); *Hymenoscypha electrina*—40 (iv, n.s., 140; 11 (142); *Peziza electrina*—27 (xxiii, 345); 14 (viii, 155); 40 (i, n.s., 86). On pine leaves and rotten wood.
- tumidula* (Rob. ex Desm.) Boud. *Helotium*—35 (342, 1901; 7 (285). White in *Farlowia* 1, 165, suggests that Mance's specimens were wrongly named. On decaying oak leaves.
- turgidella* (Karst.) Boud. 28 (vi, 59, 1921). On dead grass stems, Perth.
- ulcerata* (Phill. & Plowd.) Boud. 28 (iv, 372; xxiii, 244; *Calloria*—11 (330; *Peziza*—Phelps & Pownall in 14 (iv, 122*, March 1876; *Pseudopeziza Tripolii* (B. & Br.) Mace—28 (xxiii, 250; *H. ulcerata*; *P. Tripolii*—8 (iv, 201); *Peziza tripolii*—Berkeley & Broome in 19 (xvii, No. 1623, Feb. 1876; Bux. *P. ulcerata*—43 No. 83; Cooke, 'Fung. Brit.', Ed. 2, No. 549. On dead stems of *Aster tripolium*.
- Mniaecia Jungermanniae* Fr. Boud. 28 (iv, 372); Rev. mycol. (vii, n.s., 64†, ascus pore; Nannfeldt, Inop. Disc., 225; Boudier, Icones, pl. 455†; *Humaria*—8 (iv, 419; Glasg. Nat. (vi, 76); *Peziza*—40 (iv, n.s., 135); 11 (101); 41 (pl. 22, fig. 87; *Asciobolus*—13 (337); 15 (226); 19 (xv, No. 1062, with fig., 1865). On *Jungermannia* and other hepatics.
- Orbilia Boydii* A. L. Sm. & Ramisb. in 28 (iv, 168, 1913; iv, 372); Glasg. Nat. (v, 120. According to Nannfeldt in 28 (xx, 195), this is a young form of *Pezizula myrtilina* Karst. On stems of *Vaccinium Myrtillus*.
- coccinella* [Somm.] Fr. Boud. 28 (iv, 372; Boudier, Icones, pl. 461†; 115 (22); 7 (300; 8 (iv, 144; *Calloria*—11 (326, 1887; also form *condensata* Phill.—11 (329; 40 (iv, n.s., 186). On dead wood.
- curvatispora* Boud. 28 (x, 362, 1917; v, 417; vi, 78); Boudier, Icones, pl. 463†. On decaying oak branches.
- flexuosa* (Croul.) Boud. 28 (iv, 372, position doubtful; vii, 297); 115 (22); 8 (iv, 146; 14 (xxii, 44); Crouland in 35 (171, 1894. On decaying bark and wood.
- leucostigma* Fr. 28 (iv, 372; 115 (22; 71 (xxxviii, 134; xxxiv, 13, 15; 27

- (I, 192); Proc. Hampshire Fld Cl. (1910, 339); **7** (301); **8** (IV, 147); *Calloria*—**40** (IV, n.s., 186); **11** (330); *Peziza*—**27** (XVII, 364); **13** (322); **15** (703); **18** (371); **20** (II, 206, 1836). On dead wood, sticks, etc.
- Orbilbia luteo-rubella** (Nyl.) Karst. **28** (I, 89; IV, 372); **115** (22); **7** (301); **8** (IV, 149); *Calloria*—**11** (333); **14** (X, 68, 1881). Exs.: **43** (No. 185). On dead willow bark and on dead *Polyporus*.
- **marina** (Phill.) Boyd in Brit. Assn. Handbk. on Nat. Hist. of Clyde Area (69, 1901); Glasg. Nat. (I, 113; IV, 24; VIII, 2); **28** (III, 113*). *Calloria marina* Phill. MS. On *Fucus*, *Ascophyllum* and *Halydrys*.
- **retrusa** (Phill. & Plowr.) Sacc. **28** (IV, 372, position doubtful); *Pseudopeziza*—**7** (294); **8** (IV, 204*); *Calloria*—**11** (407); *Peziza*—Phillips & Plowright in **14** (IV, 122*, 1876); ? = *Briardia*—Boudier, Hist. et Class. Disc. d'Europe, 103. Exs.: **43** (No. 126). On dead larch needles.
- **rubella** (Pers. ex Fr.) Karst. **28** (IV, 372); **115** (22); **8** (IV, 145); **71** (XXVIII, 134); *Calloria*—**40** (IV, n.s., 186); **54** (IV, 731); **11** (334); *Peziza*—**13** (324); **14** (III, 122); **19** (XV, No. 1484, 1875); *Hyalinia rubella* (Fr.) Nannfeldt—Inop. Disc., 252†. On decayed wood.
- **scotica** Mass. **28** (IV, 372, uncertain position); **8** (IV, 144); Massee in **14** (XXII, 99, 1894). Nannfeldt in **28** (XX, 199), states that this is identical with *Orbilbia vinosa* (Alb. & Schw.) Karst. On rotten wood.
- **vinosa** (Alb. & Schw. ex Fr.) Karst. **28** (IV, 372); **115** (22); **71** (XXVIII, 134; XXXI, 13); **7** (301); **8** (IV, 145); *Calloria*—**40** (IV, n.s., 186); **11** (333*); *Peziza*—**15** (700); **18** (370); **20** (II, 205, 1836). On fallen branches, wood, bark, also on sacking, leather and rope.
- **xanthostigma** Fr. **28** (IV, 372); **115** (22); **106** (XI, 314); **71** (XXVIII, 134; XXXI, 13); **15** (XLII, 51); Boudier, Icones, pl. 460†; as *Calloria*—**40** (IV, n.s., 186); **11** (329); *Peziza*—**13** (322); **15** (703); **18** (371); **20** (II, 206, 1836); *Orbilbia leucostigma* var. *xanthostigma*—**7** (301); **8** (IV, 148); **28** (VI, 264, *O. coccinella*). On dead wood.
- Polydesmia pruinosa** (B. & Br.) Boud. **28** (IV, 372; VII, 9); **115** (22); **106** (XXVI, 227; XXVII, 27); Boudier, Icones, pl. 453†; *Belonidium*—**115** (24); **71** (XXXI, 13); **15** (27 (I, 192); **37** (1907, 240, spores germinating on surface of disk; 1909, 375); **7** (288); **8** (IV, 226); *Helotium*—**40** (IV, n.s., 142); **11** (165); **27** (XVI, 364); **15** (714); Berkeley & Broome in **19** (XVIII, No. 1174, with fig., 1866); as *Belonidium Jerdoni*—**37** (1909, 375). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 575; Ed. 2, No. 390; **43** (No. 89). On *Hypoxylon fuscum*, *Diatrype stigma* and on dead wood.

CIBORIACEAE

- Belonidium Clarkei** Mass. & Crossl. **28** (I, 196; IV, 374); **115** (24); **7** (288); Massee & Crossland in **35** (181*, 1901). On damp wood.
- **Jerdoni** (Cooke & Phill.) Mass. **28** (IV, 374); **7** (289); **8** (IV, 229); *Mollisia lurida*—**40** (IV, n.s., 174); **11** (197); *Octospora lurida*—**120** (I, 668, 1821). Nannfeldt in **28** (XX, 191), states that *Belonidium Jerdoni* and *Peziza lurida* are synonymous with *Pseudohelotium pineti* (Batsch ex Fr.) Fuckel. On dead leaves of *Pinus sylvestris*.
- **minutissimum** (Batsch ex B. & Br.) Phill. **28** (IV, 374); **8** (IV, 224); **11** (149); *Peziza*—**15** (700); **19** (XV, No. 1071, 1865, with fig.); *P. Helminthosporii* Blox. MS. in Kew Herbarium. On wood and twigs among *Helminthosporium* mycelium.
- **vexatum** de Not. **28** (IV, 374); **115** (24); **7** (289); **8** (IV, 228); Boudier, Icones, pl. 500†; **35** (1898, 359); *Peziza*—**13** (321); *Belonidium culmicolum*—**40** (IV, n.s., 140); **11** (148*, 1887); *Belonioscypha campanula* (Fr.) Rehm—Nannfeldt, Inop. Disc., 301†. Exs.: **43** (No. 116). On dead culms of Gramineae and *Juncus*.
- Belonidium Arctii** (Phill.) Sacc. **28** (IV, 374); *Belonidium*—**8** (IV, 225); *Mollisia*—**11** (183); *Peziza*—Phillips in **46** (IV, n.s., 58*, 1883); *Pyrenopeziza Arctii* (Phill.) Nannfeldt—Inop. Disc., 142†; **28** (XX, 192). Exs.: Vize, Micro-fungi of Britain, No. 476. On dead stems of *Arctium Lappa*.
- **excelsius** (Karst.) Boud. **28** (IV, 374); *Belonidium*—**8** (IV, 229); **40** (IV, n.s., 140); **11** (150); *Peziza* (*Mollisia*)—**14** (VIII, 102); **13** (326, 1879); *Belonopsis excelsior* (Karst.) Rehm—Nannfeldt, Inop. Disc. (103, apothecial structure). On dead culms of *Arundo*, etc.

- Belonium filisporum** (Cooke) Sacc. 28 (iv, 374); 115 (24); *Belonidium*—7 (289); 8 (iv, 226); 11 (152); *Peziza*—Cooke in 14 (iii, 66, 1874). Nannfeldt in 28 (xx, 192), states that *Belonopsis pallens* (Sacc.) Keissl. is the same as this. On sheaths of various grasses and *Juncus*.
- rhabdospermum** (B. & Br.) Boud. 28 (iv, 374); *Peziza*—Berkeley & Broome in 19 (xvii, No. 1621, with fig., 1876); 46 (ii, pt. 1, 216); *Tapesia*—11 (280). According to Massee in 7 (276) and 8 (iv, 299) and others, this is identical with *Tapesia* (= *Arachnopeziza*) *aurata*. On dead wood.
- Chlorosplenium aeruginellum** (Nyl.) Karst. 54 (xv, 428, 1944). On dead stems of meadowsweet.
- aeruginosum** (Oeder ex Fr.) de Not. 28 (iv, 243, pure cultures; iv, 373); 115 (23); Boudier, Icones, pl. 485†; Rev. mycol. (vii, n.s., 67†, structure of pore); 71 (xxviii, 133; xxxiv, 13), 14); Proc. Belfast Nat. Fld Cl. (Appendix 1884-5, 310); 27 (L, 191); 64 (xxxvi, 82); 65 (xii, 281); 8 (iv, 285*); 40 (iv, n.s., 140); 11 (147*); 114 (187†); *Chlorociboria*—100 (xxviii, 391); *Helotium*—27 (xvii, 364); 15 (708); 70 (i, n.s., 298); 120 (i, 661); 18 (372); *Peziza*—58 (151); 39 (v, pl. 241); 20 (202); *Helvella*—55 (Appendix iii, 258); 42 (pl. 347); 38 (Ed. 2, iii, 432); 44 (fasc. 2, 24, 1790). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 389; 43 (No. 86). On fallen oak branches, rotten wood.
- discoideum** Massee in 8 (iv, 286, 1895); 28 (iv, 373). On decorticated wood, on old *Robinia* trunk.
- elatinum** (Alb. & Schw. ex Fr.) Sacc. 28 (iv, 373); 8 (iv, 287, 1895); Nannfeldt, Inop. Disc., 288—taxonomic note under *Kreigeria*. Small, fallen branches of *Abies pectinata*.
- versiforme** (Pers. ex Fr.) de Not. 28 (iv, 373; vii, 296); Boudier, Icones, pl. 486†; 8 (iv, 287); 11 (146); *Helotium*—15 (713); 18 (372*); *Chlorociboria*—100 (xxviii, 393†); *Peziza*—19 (vi, No. 159, 1841). Exs.: Berkeley, 'Brit. Fung.', No. 274. On stumps of ash, on fir cones and trunks.
- Ciboria amentacea** (Balb. ex Fr.) Fuckel 28 (iv, 372); 106 (xxvii, 36); 115 (22); 7 (289); 8 (iv, 277); *Hymenoscypha*—40 (iv, n.s., 137); 11 (120); *Peziza*—13 (320); 14 (vi, 23, 1877); 40 (iv, 79). Exs.: 43 (No. 116). On catkins of willow, hazel and alder.
- Broomei** (Phill.) Boud. 28 (iv, 372); *Helotium*—8 (iv, 244); *Hymenoscypha*—Phillips in 11 (129*, 1877); Nannfeldt in 28 (xxiii, 240), states that this and *P. Sowerbyi* Cke. are synonyms of *Peziza sub-ferruginea* Nyl. On dead wood.
- caucus** (Rebent. ex Fr.) Fuckel 28 (iv, 372); Nannfeldt, Inop. Disc. (308, taxonomy); 8 (iv, 278); 71 (xxviii, 133); *Hymenoscypha*—40 (iv, n.s., 137); 11 (121); *Peziza*—70 (i, n.s., 298); 109 (for 1870, 1871, 208); 13 (320); 15 (699); 14 (vi, 23); 18 (370); 19 (vii, No. 572, 1851). On fallen poplar catkins.
- ochracea** Mass. 28 (iv, 372); 71 (xlb, 51); 8 (iv, 276); *Helotium tuba* Fr. var. *ochracea* B. & Br.—13 (330); 19 (xv, No. 1486, 1875); *Hymenoscypha tuba* var. *ochracea*—11 (126). According to Nannfeldt in 28 (xxiii, 240), *Ciboria ochracea* (B. & Br.) Mass. is a synonym of *Lachnum pygmaeum* (Fr.) Bres. On decaying vegetation.
- Sydowiana** Rehm 28 (iv, 372; vi, 246); 115 (22); *Helotium renisporum*—115 (23); 71 (xxviii, 133); 7 (284); 8 (iv, 258); *Hymenoscypha renisporum*—11 (143). On decaying leaves of oak etc., especially on petioles and veins.
- Cyathicula alba** (Pat.) Sacc. 28 (iii, 289, 1911; iv, 374); Trans. Perthsh. Soc. nat. Sci. (vii, 19). On the side of a ditch in clay soil, near Perth.
- coronata** (Bull. ex Fr.) de Not. 28 (iv, 373); 106 (xxvii, 207); Nannfeldt, Inop. Disc., 301; 115 (24); Boudier, Icones, pl. 499†; 27 (L, 191); 71 (xxviii, 133); 7 (279); 8 (iv, 272); *Hymenoscypha*—40 (iv, n.s., 137); 11 (127*); *Peziza*—73 (iii, 76); 15 (698); 18 (370, 1860). Exs.: 43 (No. 121); Cooke, 'Fung. Brit.', Ed. 2, No. 379. On dead herbaceous stems, autumn and winter.
- inflexa** (Bolt. ex Fr.) Sacc. 28 (iv, 373); 54 (xv, 204); *Peziza*—Ann. Mag. nat. Hist. (v, 5); Proc. Belfast Nat. Fld Cl. (Appendix 1884-5, 309); 73 (iii, 76); 15 (698); 18 (370); 20 (201); 51 (422); 38 (Ed. 2, iii, 439); *Peziza inflecta*—111 (iii, pl. 106, fig. 2*, 1789); 42 (pl. 306); *Hymenoscypha coronata* var. *inflexa*—40 (iv, n.s., 137); 11 (127); as *Cyathicula coronata*—8 (iv, 272, p.p.). On dead herbaceous stems.
- Helotium advenulum** Phill. 28 (iv, 373); 8 (iv, 265); 14 (vi, 24); Phillips in 43 (No. 133, 1877); *Hymenoscypha*—11 (133). Exs.: 43 (No. 133). On decaying leaves of larch.

- Helotium albidum** (Rob.) Pat. 28 (iv, 373); 115 (23); Boudier, Icones, pl. 492†; Farlowia (I, 608†); 7 (285); 8 (iv, 260); *Hymenoscypha*—40 (iv, n.s., 139); 11 (138); *Peziza*—40 (III, n.s., 173); 19 (I₅, No. 1724, 1878). On decaying petioles of ash and oak.
- **albidum** var. **Aesculi** Phill. 28 (iv, 373); 7 (285); 8 (iv, 260); Phillips in 11 (138, 1877). On petioles of *Aesculus*.
- **amenti** (Batsch ex Fr.) Fuckel 28 (iv, 373); Boudier, Icones, pl. 496†; 37 (1907, 240); 8 (iv, 261); *Hymenoscypha*—40 (v, n.s., 34); 11 (143); *Peziza*—19 (VII₄, No. 1323, with fig., 1871). Exs.: 43 (No. 123). On dead willow and alder catkins in damp places.
- **aquaticum** Curr. 28 (iv, 373); 8 (iv, 251); 27 (xvii, 364); 15 (711); 19 (xv₃, No. 1075); Currey in 45 (xxiv, 154*, 1863); *Hymenoscypha*—11 (134). Nannfeldt in 28 (xxiii, 243), considers that this species was based on dwarfed specimens of *Ombrophila clavus* (Alb. & Schw. ex Fr.) Cooke. On sticks in water.
- **Aspegrenii** Fr. 28 (iv, 373); 115 (23); 8 (iv, 243); 15 (712); 18 (372); *Hymenoscypha*—11 (124); as *Peziza bicolor* var.—42 (pl. 369, fig. 7*, 1802). On rotten wood.
- **aureum** (Pers. ex Fr.) Fr. 28 (iv, 373); 115 (23); 27 (L, 191); 7 (281); 8 (iv, 240); 71 (xxxiv, 13); 15); *Hymenoscypha*—11 (139); ? *Peziza chrysocoma*—42 (pl. 152*, 1798); 71 (xxviii, 152, as doubtful). On sticks and stumps in moist places in woods.
- **axillaris** (Nees) Boud. 28 (iv, 373); *Humaria*—8 (iv, 412, with note saying this is evidently a *Mollisia*); *Peziza*—40 (III, n.s., 134); 11 (93); 13 (322); 41 (pl. 23, fig. 91†); 15 (702); 18 (371); 20 (205, 1836); *Humarina*—Seaver, N. Amer. Cup Fungi, 1928, 124. In axils of leaves of *Splachnum mnioides*.
- **bryophilum** (Fr.) Mass. 28 (iv, 373); 8 (iv, 269); *Hymenoscypha*—11 (125, 1877). Amongst moss in mountain pastures.
- **calyculus** (Sow. ex Fr.) Berk. 28 (iv, 373; xxiii, 243); Ramsbottom, Handbk., 190; 115 (23); 7 (283); 8 (iv, 248); 15 (711); 18 (372); Proc. Belfast Nat. Fld Cl. (Appendix 1884-5, 310); *Hymenoscypha*—71 (xxviii, 133); 40 (iv, n.s., 138); 11 (136); *Hymenoscyphus*—120 (I, 673); *Peziza*—20 (202); 55 (685); 42 (pl. 116*, 1792); 38 (Ed. 2, III, 439, 1792); Relhan, Fl. Cantab., Ed. 3, p. 555; *Peziza infundibulum*—51 (423); *Helotium infundibulum*—19 (VII₃, No. 961). Nannfeldt in 28 (xxiii, 243), suspects that this is identical with *H. virgultorum*. On wood and branches.
- **Carmichaeli** (Berk. & Phill.) Mass. 28 (iv, 373); 8 (iv, 250); 14 (xix, 106, 1891); *Peziza*—36 (xxxv, 91*). On decayed wood.
- **chloropodium** Rea & Ellis 28 (III, 292, 1911; III, 379; IV, 373); 115 (23). On dead stems, Brignall Banks, Yorkshire.
- **ciliatosporum** Boud. 28 (vi, 134, 1919; xviii, 76*, cultural and morphological observations); 108 (ix, 57); as *Helotium scutula*—100 (xxxiv, 159, synonymy). On stems of herbaceous plants, Michaelmas daisy, etc.
- **cuniculi** Boud. 28 (xiii, 260, 1928); 117 (xiii, 6†). On dung of rabbit and bark of fallen tree, Staffs.
- **cyathodeum** (Bull. ex Fr.) Karst. 28 (iv, 373; xv, 185); 115 (23); Boudier, Icones, pl. 494†; 27 (L, 192); 7 (284); 8 (iv, 252); 71 (xxviii, 133; xliii, 51); *Phialea cyathodea* (Fr.) Gill.—Nannfeldt, Inop. Disc., 301†; *Hymenoscypha*—71 (xxviii, 133); 40 (iv, n.s., 139); 11 (140); 106 (iv, 219); *Hymenoscyphus*—120 (I, 674); *Peziza*—13 (320); 15 (699); 18 (370); 20 (202); *Peziza cyathoides*—95 (II, 1052, 1777); 55 (III, 264); *P. pedicellata*—42 (pl. 369, fig. 4*); as *Hymenoscypha cacaliae*—11 (145); as *Peziza cacaliae*—15 (699); 18 (370); 19 (VII₂, No. 569); as *Hymenoscypha clavata*—40 (iv, n.s., 140); 11 (141); as *Peziza cyathodea* var. *clavata*—13 (320); *Hymenoscypha cyathodea* var. *Epilobii*—11 (141); ? = *Peziza lutea parva*—Ray, Syn. see 95 (II, 1053, 1777). Exs.: Berkeley Exsic., No. 158; 43 (No. 79 & 80); Cooke, 'Fung. Brit.', Ed. 2, No. 377. These species were treated as synonymous by Massee but there are undoubtedly two or even three distinct species. On dead stems of thistle, potato, bracken, *Cheiranthus*, *Epilobium* etc., also seed vessels of *Cheiranthus incana*.
- **eburneum** (Desm.) Gill. 28 (iv, 373); 115 (23); 8 (iv, 264); *Hymenoscypha*—11 (145, 1887); 40 (iv, n.s., 140). On leaves of grasses and sedges in autumn and winter.
- **emergens** (Cooke & Phill.) Mass. 28 (iv, 373); 115 (23); 7 (283); 8 (iv, 251*); *Hymenoscypha* Cooke & Phillips in 11 (139, 1887); 40 (iv, n.s., 139). On dead branches, emerging from beneath the bark.
- **epiphyllum** [Pers.] Fr. 28 (iv, 373); 115 (23); Farlowia (I, 139†); 70 (I, n.s., 298);

- 102 (iv, 234†, anatomy & morphology); 7 (284); 8 (iv, 257); 40 (iv, n.s., 142); 11 (163); 71 (xxviii, 133); 15 (715); 18 (372, 1860). On dead leaves of oak, beech and elm.
- Helotium flexuosum** Mass. 28 (iv, 373); 8 (iv, 263, 1895); Trans. Perthsh. Soc. nat. Sci. (vii, 18); *Helotium citrinulum* Karst.—Farlowia (i, 600†). Base of stems of *Dactylis glomerata*.
- **fructigenum** (Bull. ex Fr.) Fuckel 28 (iv, 373); 115 (23); Boudier, Icones, pl. 487†; 102 (iv, 233†, anatomy and morphology); *Hymenoscypha*—40 (iv, n.s., 138); 106 (iv, 219); 11 (135); *Peziza*—51 (422); 55 (685); 20 (201); 38 (Ed. 2, iii, 440, 1792); 42 (pl. 117); *Helotium virgultorum* var. *fructigenum*—71 (xxxi B, (13), 15); 7 (282); 8 (iv, 246); as *Helotium calyculus*—37 (1911, 377). Exs.: Cooke, 'Fung. Brit.', Ed. 1, no. 479. On acorns, beech-mast, chestnuts, fir cones, hazel nuts, etc.
- **gramineum** Phill. 28 (iv, 373); 115 (23); 27 (I, 192); 7 (286); 8 (iv, 262); 54 (iv, 731); Phillips in 11 (155, 1887). On dead and decaying grass.
- **Hedwigii** (Phill.) Mass. 28 (iv, 373; xxiii, 243, = *Lachnum pygmaeum* (Fr.) Bres.); 115 (23); 8 (iv, 243); *Hymenoscypha*—Phillips in 11 (130, 1887); *Octospora fungoidaster*—Hedwig, Laub-Moose (ii, pl. xix, fig. A†). On twigs of hazel.
- **herbarum** (Pers. ex Fr.) Fr. 28 (iv, 373); 115 (23); Boudier, Icones, pl. 497†; 71 (xxxi B, (13), 15); 106 (xxvii, 27); 7 (284); 8 (iv, 255); 40 (iv, n.s., 142); 11 (166); 15 (714); 27 (xvii, 364); 18 (372); *Peziza*—20 (204); 51 (424); *Calycina*—120 (i, 670, 1821); *Malotium*—Velenovsky, 210. Exs.: 43 (No. 87); Cooke, 'Fung. Brit.', Ed. 2, No. 391. On dead stems of herbaceous plants.
- **luteo-virescens** (Rob.) Karst. 28 (iv, 373); *Ciboria*—115 (22); 7 (279); 8 (iv, 275); *Hymenoscypha*—40 (iv, n.s., 137); 11 (121); *Peziza pallido-virescens* Phill.—14 (vi, 24); 43 (No. 122, 1877); 40 (iv, 163). On decaying petioles and twigs of maple, sycamore and lime, also on roots of grasses and on wood.
- **lutescens** [Hedw.] Fr. 28 (iv, 373); 115 (23); 27 (I, 191); 71 (xxviii B, 133); 7 (282); 8 (iv, 244); 13 (329); 15 (709); 18 (372); *Peziza*—19 (iii, No. 826, 1859); *Hymenoscypha*—40 (iv, n.s., 138); 11 (131); *Octospora*—Hedwig, Laub-Moose (ii, pl. IX, fig. C†). On dead twigs, pine cones, etc.
- **moniliferum** (Fuckel) Rehm 28 (iv, 373; vii, 4); 115 (23); 7 (283); 8 (iv, 249*); *Peziza*—13 (321); 14 (iv, 111, 1875); 40 (iii, 201); *Hymenoscypha*—40 (iv, n.s., 138); 11 (130). *Bispora monilioides* is the conidial stage. On cut ends of trunks and stumps.
- **nitidulum** (B. & Br.) Mass. 28 (iv, 373); 115 (23); 7 (286); 8 (iv, 263); *Hymenoscypha*—11 (142); *Peziza*—36 (xxxv, 93*); 15 (699); 18 (370); Berkeley & Broome in 19 (vii, No. 570, 1851). On dead leaves and stems of *Aira caespitosa*.
- **nubilipes** Boud. 28 (iv, 373); Boudier, Icones, pl. 491†.
- **phascoides** Fr. 28 (iv, 373); 8 (iv, 268); 11 (169); 15 (710); 18 (372); *Peziza*—20 (204, 1836). On leaves of species of *Phascum*.
- **phylogenum** Rehm 28 (iv, 373); 115 (23); Farlowia (i, 156); 8 (iv, 258); 106 (xxvii, 27). On the veins of decaying poplar and beech leaves.
- **phyllophilum** (Desm.) Karst. 28 (iv, 373); 115 (23); Farlowia (i, 157†, known with certainty only from France); 71 (xxxi B, (13), 15); 7 (284); 8 (iv, 257); 11 (162); *Helotium albo-punctum*—46 (iii, 137, 1880). On dead leaves of *Fagus*, *Acer*, etc.
- **pileatum** Karst. 35 (84, 1947) this is apparently the only authentic record; also see *H. terrigenum*. Mulgrave Woods, Yorkshire.
- **politum** Phill. 28 (iv, 373); 8 (iv, 256); Phillips in 11 (155, 1887). On roots under soil surface.
- **pulchellum** (Fuckel) Boud. 28 (iv, 373). References to British records of this species refer to *Dasyscypha bicolor* q.v. On fallen twigs.
- **pygmaeum** (Fr.) Karst. 28 (iv, 373); *Peziza*—14 (iv, 23); 13 (309); 15 (679); 19 (xv, No. 1066, with fig., 1865; xviii, No. 1160*, with fig.); 45 (xxv, 432*); *Lachnella*—40 (iv, n.s., 178); 11 (242); *Dasyscypha*—7 (272); 8 (iv, 353); Dennis 1949, 10; *Lachnum*—28 (xxiii, 243 = *Helotium flexipes* Cooke & Phill.). On wood and branches (*Ulex*) partly buried in sand or moss; also on coniferous wood.
- **repandum** Phill. 28 (iv, 373); 115 (23); 7 (284); 8 (255); 40 (iv, n.s., 141); 11 (161, 1887). On old stems of herbaceous plants, *Spiraea*, *Epilobium*, etc., and also on cast-out hearth-rug.
- **rhizophilum** Fuckel 28 (iv, 373); Boudier, Icones, pl. 489†; 71 (xxviii B, 133);

- Proc. Belfast Nat. Fld Cl. (Appendix 1884-5, 310); **8** (iv, 264); **15** (714, 1871); *Hymenoscypha*—**11** (144). On grass rhizomes and roots.
- Helotium rhodoleucum** Fr. **28** (iv, 373); **71** (xxxib, (13), 6); **8** (iv, 268); **14** (xiii, 74, 1885); *Hymenoscypha*—**40** (iv, n.s., 138); **11** (131); *Phialea rhodoleuca* (Fr.) Sacc.—Nannfeldt, Inop. Disc., 301. On decayed *Equisetum* and other remains in damp places.
- **rubescens** Cr. **28** (iii, 281, 1911; iv, 373); Trans. Perthsh. Soc. nat. Sci. (vii, 18). On beech, ash and hazel stumps, Perth.
- **salicellum** (Hazsl.) Fr. **28** (iv, 373); **115** (23); **7** (282); **8** (iv, 245); **40** (iv, n.s., 141); **11** (159); **15** (713); **18** (372); *Peziza*—**19** (vii, No. 573, 1851). *Pachydisca badia* (Phill.) Boud. is a synonym according to Nannfeldt in **28** (xxiii, 247). Exs.: Cooke, 'Fung. Brit.', No. 558. On willow twigs, etc.
- **scutula** (Pers. ex Fr.) Karst. **28** (iv, 373; xv, 178, development); **115** (23); **27** (I, 192); **7** (284); **8** (iv, 253); **100** (xxxiv, 159, = *Ciboria ciliatospora*); **71** (xxviii, 133; xlb, 51); **70** (xxi, n.s., 402); **40** (vi, 125, 1881); *Hymenoscypha*—**11** (136); **40** (vi, n.s., 125; iv, n.s., 139). On dead and decaying herbaceous stems and on skeleton leaves of beech.
- **scutula** var. **fucatum** Phillips—**11** (137, 1887); **8** (iv, 254); Farlowia (1, 609†); *Peziza fucata*—**14** (iv, 132*, 1876). Exs.: **43** (No. 120). On dead stems of *Polygonum* lying in water.
- **scutula** var. **Lysimachiae** Phillips in **11** (137, 1887); **8** (iv, 254); **43** (No. 120A). On dead stems of *Lysimachia vulgaris*.
- **scutula** var. **Menthae** Phillips in **11** (137); **28** (iv, 373); **8** (iv, 254); *Helotium Menthae*—**14** (x, 68, 1881). Exs.: **43** (No. 188). On decaying stems of *Mentha*.
- **scutula** var. **Rubi** Rehm **115** (23).
- **scutula** var. **Rudbeckiae** Phillips in **11** (138, 1887); **28** (iv, 373); **8** (iv, 254). On dead stems of *Rudbeckia*.
- **serotinum** [Pers.] Fr. **28** (iv, 373); **115** (23); **102** (iv, 231, anatomy and morphology); **7** (281); **8** (iv, 241); **15** (709); **18** (372); *Hymenoscypha*—**11** (125); *Peziza*—**20** (201); *Helvella aurea*—**38** (Ed. 3, iv, 340); **111** (iii, pl. 98, fig. 2*, 1789). On sticks and stalks of plants in watery places.
- **sordidum** (Fuckel) Rehm **28** (iv, 373); **115** (23); *Hymenoscypha*—**40** (iv, n.s., 140); **11** (144); *Pezizella*—**40** (vi, 163, 1881); *Helotium Fuckelii* Mass.—**7** (281); **8** (iv, 239); *Allophyllaria vulgaris* (Fr.) Nannf. Inop. Disc., 291. On dead leaves and stems of wild rose, bramble, broom, etc.
- **sparsum** Boud. **28** (iv, 317*, 1914; iv, 373); Trans. Perthsh. Soc. nat. Sci. (vii, 17); Boudier, Icones, pl. 495†. On mid-rib and veins of dead oak leaves, nr. Perth.
- **strobilinum** (Fr.) Fuckel **28** (iv, 373); **8** (iv, 267); *Antinoa*—Velenovsky, 215; *Hymenoscypha*—**40** (iv, n.s., 138); **11** (133); *Peziza*—**14** (ii, 186, 1874); **40** (v, 234); **13** (321); **19** (xv, No. 1483). On cone scales.
- **sublateritium** B. & Br. **28** (iv, 373); **115** (23); **7** (284); **8** (iv, 253); **40** (iv, n.s., 141); **11** (161); **36** (xxx1, 479*); **13** (332); **14** (iii, 122); Berkeley & Broome in **19** (xv, No. 1488, 1875). On stems of herbaceous plants.
- **subtile** Fr. **28** (iv, 373); **115** (23); **8** (iv, 266); **15** (708); **18** (371); *Hymenoscypha*—**40** (iv, n.s., 138); **11** (132); *Peziza*—**20** (208, 1836). On decaying pine leaves.
- **sulphuratum** (Schum. ex Fr.) Phill. **28** (iv, 373); **115** (23); **8** (iv, 265); **40** (iv, n.s., 141); **11** (161); **14** (x, 69, 1881); *Peziza*—**40** (vi, 122, 1881). Exs.: **43** (No. 189). On fallen pine and oak leaves, and on the ground.
- **terrigenum** Cooke & Phill. in Herb. Kew.; **28** (iv, 373); **115** (23); **71** (xxxib, (13), 6 & 10); **7** (280); **8** (iv, 238); as *Helotium pileatum* Karst.—**11** (160, 1887). On twigs, partially buried, in damp places.
- **tetra-ascosporum** Rea **28** (iii, 129, 1909; iv, 12 & 373; xix, 284); Trans. Perthsh. Soc. nat. Sci. (vii, 19). On dry stems of *Phalaris arundinacea*.
- **tuba** [Bolt.] Fr. **28** (iv, 373); Boudier, Icones, pl. 490†; **71** (xxviii, 133); **7** (286, as doubtful); **8** (iv, 271, 'doubtful species'); **27** (xvii, 364); **13** (330); **15** (711); **18** (372); *Hymenoscypha*—**40** (iv, n.s., 137); **11** (126); **38** (Ed. 2, iii, 439); **106** (iv, 219); *Peziza*—Bolton in **111** (iii, pl. 106, fig. 1, 1789); **20** (202). On fallen branches, dead leaves, etc.
- **Urticae** (Pers.) Karst. **28** (iv, 373); *Hymenoscypha*—**40** (iv, n.s., 139); **11** (141); as *Helotium cyathodeum* p.p.—**8** (iv, 252); *Peziza striata*—**15** (698); **18** (370); **19** (vii, No. 568, 1851). On dead stems of nettle and mint.

- Helotium virgultorum** (Wahl. ex Fr.) Karst. 28 (iv, 373); 115 (23); Ramsbottom, Handbk., 190; 71 (xxviii, 133; xxxiv, (13), 15); 7 (282); 8 (iv, 246); 13 (329); 27 (xvii, 364); 15 (709); 18 (372); *Hymenoscypha*—40 (iv, n.s., 138); 11 (134); var. *flavescens*—13 (329); 15 (709); 18 (372). Has been frequently confused with *Helotium fructigenum* (Bull.) Fuckel and it is therefore difficult to determine when it was first recorded. On twigs and dead wood.
- peristomialis Berkeleyi** Boud. 28 (iv, 374); *Cyathicula peristomialis*—8 (iv, 273); *Mollisia peristomialis*—11 (201*); *Peziza peristomialis*—36 (xxxv, 99); 15 (706); 19 (xviii, No. 1169, 1866, with fig.). According to Nannfeldt, 28 (xx, 201), this is not a Discomycete but belongs to Nectriaceae. On dead bark of holly.
- phialea bolaris** (Batsch. ex Fr.) Quél. 28 (iv, 373; xii, 294); Boudier, Icones, pl. 482†; *Helotium*—8 (iv, 247); 71 (xxviii, 133); *Calycina*—100 (xxvi, 346†); *Hymenoscypha*—40 (iv, n.s., 137); 11 (124); *Peziza*—15 (695); 18 (370); 20 (200, 1836); *Tapesia*—13 (318). Exs.: 43 (No. 171). On fallen branches of holly, willow, etc.
- echinophila** (Bull. ex Fr.) Quél. 28 (iv, 373); Boudier, Icones, pl. 481†; *Ciboria*—7 (279); 8 (iv, 276); 28 (i, 89); *Hymenoscypha*—40 (iv, n.s., 137); 11 (122); *Peziza*—40 (vi, 124); 15 (698); 109 ('1870', publ. 1871, 208); 18 (370); 19 (vii, No. 567, 1851). Exs.: 43 (No. 32); Cooke, 'Fung. Brit.', Ed. 2, No. 367. On fallen involucre of sweet chestnut.
- firma** (Pers. ex Fr.) Gill. 28 (iv, 373); 115 (22); Boudier, Icones, pl. 483†; 71 (xlii, 51); *Hymenoscypha*—Ramsbottom, Handbk., 189; 11 (123); 40 (iv, n.s., 137); *Rutstroemia*—Friesia (iii, 280); 105 (xli, 387, conidial forms); 71 (xxxiv, (13), 14); *Peziza*—70 (i, n.s., 298); 27 (xvii, 364); 15 (697); 18 (370); 20 (200); *Ciboria ochroleuca* (Bolton) Mass.—115 (22); 7 (278); 8 (iv, 274); 71 (xxviii, 133); *Peziza ochroleuca* Bolt.—58 (151); 39 (i, pl. 5*); 55 (685); 51 (422); 38 (Ed. 2, iii, 439); 42 (pl. 115*); Bolton in 111 (iii, pl. 105, fig. 1, 1789). Exs.: 43 (No. 78); Cooke, 'Fung. Brit.', Ed. 2, No. 646. On decayed sticks of oak.
- muscosa** E. G. Gray in 28 (xxv, 332, 1942); ? = *Stromatinia temulenta* Prill. & Delacr. q.v. Blind seed fungus of *Lolium perenne*, *L. multiflorum*.
- petiolorum** (Desm.) Gill. 28 (iv, 373); 115 (22); *Cyathicula*—115 (24); 7 (279); 8 (iv, 273); *Hymenoscypha*—11 (132, 1887); *Peziza*—102 (xv, 347); *Rutstroemia*—Friesia (iii, 286). On petioles of fallen beech and oak leaves.
- pinæa** (Bon.) Boudier, Hist. et Class. Disc. d'Europe, 110; *Belonidium*—28 (v, 418, 1917). On fallen pine cones, Tanworth-in-Arden.
- Sclerotinia aestivalis** Pollack, grown by F. Harrison on quince brought to this country from Australia, May 1931. In Herb. B.M.
- brunneo-carpa** F. T. Bennett in 34 (xxiv, 236, 1937). Causing dollar spot of turf.
- bulborum** (Wakk.) Rehm 28 (iv, 372); 22 (No. 117, 10); 77 (for 1924, 111); 93 (208); 112 (133); 89 (106*); 8 (iv, 284); 31 (xvi, 160* & 592, 1894). Conidial stage: *Botrytis* sp. On bulbs of *Hyacinthus*, *Scilla*, *Crocus*, *Allium*, etc.
- Candolleana** (Lév.) Fuckel 28 (iv, 372); Friesia (iii, 328); Nannfeldt, Inop. Disc. (308, taxonomy); 115 (22); 93 (222); 112 (134); 34 (xiv, 193); 7 (277); 8 (iv, 281); *Hymenoscypha*—11 (114); *Peziza*—19 (i, No. 1723, 1878); *Ciboria*—Whetzel in 100 (xxxvii, 668); sclerotial stage is *Sclerotium pustula* Fr. On leaves of sweet chestnut and oak.
- convoluta** Drayt. 22 (No. 117, 137, 1939). *Botrytis convoluta* stage only. On rhizomes of garden varieties of Iris.
- Crataegi** Magn. 93 (183); 28 (xxv, 301); 85 (xli, 18); 77 (1926-7, ii suppl., 86, 1928). Leaf blotch of *Crataegus* spp. in Scotland.
- Curreyana** (Berk.) Karst. 28 (iii, 131; iv, 372; xi, 17); Farlowia (ii, 427*); Glasg. Nat. (ii, 139); 115 (22); Boudier, Icones, pl. 472†; 7 (278); 8 (iv, 282); 71 (xlii, 51); *Myriosclerotinia* Buchw.—Friesia (iii, 291); *Hymenoscypha*—40 (iv, n.s., 136); 11 (116); *Peziza*—15 (697); 36 (i, 147); 45 (xxiv, 495*); *P. Curreyi*—18 (370, 1860); as '*Sclerotium roseum*'—36 (i, 14). The correct name for the sclerotial stage is *S. juncinum* Desm. The conidial form is *Sphacelia tenella* Sacc. = *S. Curreyana* Grove, 1912, p. 46. Exs.: 43 (No. 31). On culms of *Juncus* spp.
- Cydoniae** Schellenb. 93 (120); 85 (xxviii, 49); Wormald, 'Diseases of Fruits and Hops', 134; 33 (xli, 2 & 7); 28 (x, 303, conidial stage); 77 (for 1925, (1927), 89); *Monilinia* Whetzel in 100 (xxxvii, 672). On *Pyrus Cydonia*.

- Sclerotinia Draytoni** Buddin & Wakefield in **28** (xxix, 150, 1946). Parasitic on corms of *Gladiolus* spp. Apothecia produced by artificial spermatization.
- **Duriaceana** (Tul.) Quél. **28** (iv, 372); **115** (22); Farlowia (ii, 390†, for description and nomenclature); Boudier, Icones, pl. 473†; **7** (278); **8** (iv, 283); *Myriosclerotinia* Buchw.—Friesia (iii, 299); *Hymenoscypha*—**11** (115, 1887). Conidial stage is *Sphacelia ambiens* Sacc.; and the sclerotium is *S. nigricans* (Tul.) Sacc. *Michelia* 2, 134. On culms of *Carex arenaria*, *C. stricta*, etc.
- **filipes** (Phill.) Sacc. **28** (iv, 372); **8** (iv, 281); *Hymenoscypha*—Phillips in **11** (116, 1887). Amongst vegetable remains.
- **fruticicola** (Wint.) Rehm **93** (136, 153); Wormald, 'Diseases of Fruits and Hops', 63; **110** (xxviii, 955); *S. americana*—**23** (xxxv, 750, 1928). On imported peaches.
- **Fuckeliana** (de Bary) Fuckel **28** (ii, 35; iv, 372); **89** (158*); **31** (1906, 42); **115** (22); Viennot-Bourgin—Les Champ. parasites, i, 689†, development. Boudier, Icones, pl. 468†; **112** (135); **33** (ii, 361; xxii, 479); **27** (xli, 19, 1903); **56** (xxi, 86*; xxvi, 41*; xxviii, 319*). On lilies, daffodil, snowdrop, gooseberry, etc.
- **Gladioli** Drayt. **28** (xxv, 291, 1942); **100** (xxvi, 46, sexual mechanism); **71** (xlb, sclerotium); **93** (207, sclerotium); **85** (xxxviii, 19); **34** (xxx, 211, control); Friesia iii, 305. On *Gladiolus* hybrids.
- **heterocarpa** Bennett **34** (xxiv, 254, 1937); Farlowia (ii, 436 = *Ciboria Armeniæ* v. Hoehn. = *Rutstroemia*). Dollar-spot of turf.
- **hirtella** Boud. **28** (xxix, 151, 1946). On fallen bud-scales of deciduous tree, in a damp place, Leith Hill, Surrey. Also from Burnham Beeches, May 1936 (J.R.).
- **laxa** Aderh. & Ruhl. **93** (123, 135, 145, 151, etc.); **79** (xi, 51); **34** (v, 28); Wormald, 'Diseases of Fruits and Hops', 1939, various citations; **28** (xx, 103, for nomenclature); Viennot-Bourgin, Les Champ. parasites, i, 709†, structure and pathology; *Sclerotinia cinerea* (Bon.) Schroet.—**65** (xxx, 339); **23** (xxxiv, 552; xxxix, 620 & 624); **112** (142); **77** (1924, 107); **33** (xxxv, 125*, 1921, first record of ascus stage in Great Britain; xxxvi, 305, shoot wilt and canker; xli, 287, brown rot; xlii, 39, resistance); **110** (viii, 139; xxviii, 955); also references to f. *pruni*—**23** (xxiv, 507; xxx, 360); **33** (xliv, 965); **112** (142); **25** (xxv, 277). Brown rot, blossom wilt of cherry, apricot, plum, peach, apple, pear, etc.
- f. **Mali** (Worm.) Harrison **93** (134, 136); **79** (xi, 50); Wormald in **34** (iii, 159, 1917); Wormald, 'Diseases of Fruits and Hops', 1939, 93; **28** (xx, 103, nomenclature); **25** (xxv, 276); **49** (ii, 36). On apples and pears, causing blossom wilt and spur canker.
- **Libertiana** Fuckel **28** (iv, 372); **115** (22); **33** (xxx, 416, cytology; xxxv, 335, physiology); **56** (xxii, p. clxxxi; xxvii, 824*); **89** (1906, 102*); **99** (xiv, 126, nomenclature); *S. sclerotiorum* (Lib.) de Bary—**93** (66, 243); J. Dep. Agric., Ireland (x, 241); Friesia (iii, 319); Wormald, 'Diseases of Fruits and Hops', 1939, 260; **112** (129); Viennot-Bourgin, Les Champ. parasites, i, 742, pathology; **69** (1907, 345*); **26** (i, 188); **85** (xxxix, 16, etc.); **56** (xxvi, 44; xxvii, 816; li, 252*, detailed study of disease on *Antirrhinum* and *Schizanthus*); **32** (xxxiii, 373, culture notes); **33** (ii, 355; xxii, 479); **23** (ix, 310; xiv, 295, 559; xviii, 419; xxiii, 1095; xliii, 124); **25** (iii, 8; x, 248, and many other references); **65** (xxx, 335); **80** (88); **79** (viii, 25; xii, 31); **71** (xxviii, 133; xxxiv, (13), 6); **89** (1906, 94*); **8** (iv, 280); *Hymenoscypha sclerotiorum*—**40** (iv, n.s., 136); **11** (115); **54** (iv, 731); *Peziza sclerotiorum*—**14** (xii, 44); *P. sclerotoides*—**33** (ii, 361, a slip for *P. sclerotiorum* made by Frank, 1880, Die Krankheiten der Pflanzen, 530); *P. postuma*—**56** (xxvii, 816*); **23** (iii, 125; vi, 483); Imperfect form is *Sclerotium durum* Pers. sensu Rostrup. On potato, cucumber, *Vicia*, *Phaseolus*, carrot, artichoke, tomato, flax, *Antirrhinum*, *Begonia*, *Campanula*, *Dahlia*, *Schizanthus*, hops, *Anchusa*, etc.
- **Mespili** Schellenb. **28** (vii, 287, 1922; xii, 2); **34** (vii, 173, conidial stage recorded); **112** (146); **33** (xli, 287); **85** (xxiii, 31; xxviii, 49); *Monilinia*—Whetzel in **100** (xxxvii, 673). On leaves and fruit of medlar.
- **muscorum** A. L. Sm. & Ramsb. **28** (iv, 168, 1913; iv, 372). On leaves of *Campylopus atrovirens*, near Belfast.
- **narcissicola** Gregory **28** (xxv, 35, 1941); Viennot-Bourgin, Les Champ. parasites, i, 704. On sclerotia on aestivated leaves of *Narcissus pseudonarcissus* and *N. poeticus*.
- **polyblastis** Gregory **28** (xxii, 201, 1938; xxv, 29, biology, etc.); **22** (No. 117, 69); **31** (lxxxvi, 68; xcvi, 304); *Botrytis polyblastis* Dows. **28** (xiii, 102, conidial stage).

- Conidial stage is *Botrytis polyblastis* Dowson which causes disease of flowers and leaves on overwintered leaves of *Narcissus tazetta* var. *Soleil d'Or*, Scilly and Cornwall.
- **Sclerotinia scirpicola** Rehm As sclerotia only, i.e. *Sclerotium roseum*. Most of the records of '*Sclerotium roseum*' in this country refer to *Sclerotinia Curreyana*. Conidial form is *Sphacelia scirpicola* Ferd. & Winge. Collected by D. A. Boyd, in Ayrshire in 1913, 1914 and 1921.
- **sericea** Keay 27 (LXXV, 130, 1937); 22 (No. 126, p. 85). Parasitic on *Gypsophila elegans*.
- **sphaerosperma** Gregory 28 (xxv, 37, 1941); conidial stage is a *Botrytis* sp. Apothecia on aestivated leaves of *Allium triquetrum* from St Mary's, Scilly Isles, and at Newton Abbot, Devon.
- **sulcata** (Desm.) Whetz. Farlowia (II, 397† imperfect stages collected in Great Britain); 100 (xxi, 15, 1929, found by Whetzel in Herb. Crossland under *S. Duriacana* (Tul.) Quél.); *Myriosclerotinia* Buchw.—Friesia (III, 301); Imperfect forms are *Myrioconium affine* (Desm.) Buchw. and *Sclerotium sulcatum* Rob. ap. Desm. Among decaying *Carex* sp., Masham, Yorks. Collected 28 May 1902.
- **trifoliorum** Eriksson 28 (iv, 372); Boudier, Icones, pl. 470†; 93 (26, 27); Friesia (III, 313, culture etc.); 32 (xxiv, 50, life history); 33 (I, 333, effect on sporulation of other fungi); 112 (131); 63 (LXXIX, 68); 23 (iv, 469, 1898; v, 39; XIX, 928; XXXIV, 143, clover resistance, many other references); 79 (v, 28); 99 (VII, 432, cultural and morphological study; XXX, 870, apothecia in culture); 89 (1906, 246*); 8 (iv, 285). Causing a stem rot of clovers and various other Leguminous plants, *Onobrychis*, *Medicago*, etc.
- **trifoliorum** var. **minor** Alcock 65 (XXX, 15, 1928; XXX, 334, 1931); 93 (30). On clover seed from Central Europe and New Zealand. Fungus grown in culture.
- **tuberosa** (Hedw. ex Fr.) Fuckel 28 (iv, 372; xxv, 287; XXIX, 251*); Boudier, Icones, pl. 477†; Friesia (III, 309); 115 (22); 56 (XXVII, 15*, 937); 5 (265); 7 (276); 89 (1906, 15*); 31 (1887, 712*; 1893, 75*); 117 (XLVI, 110, cytology); 33 (III, 23); 112 (134); 8 (iv, 279); *Hymenoscypha*—40 (iv, n.s., 136); 46 (VI, n.s., 193); 11 (113); *Peziza*—13 (300); 15 (666); 109 (1873, 108, 'sclerotium is compact mycelium of different fungi'); 18 (365); 20 (189); 42 (pl. 63*); 38 (Ed. 2, III, 436); *Helvella*—44 (fasc. 2, 25, 1790); *Octospora*—Hedwig, Laub-Moose (II, pl. x, fig. B†). Exs.: Berkeley, 'Brit. Fungi', No. 153; Cooke, 'Fung. Brit.', Ed. 1, No. 558; Ed. 2, No. 183; 43 (No. 7). On wood and garden anemones.
- **Stamnaria Equiseti** (Hoffm.) Sacc. 28 (iv, 373); 115 (23); Boudier, Icones, pl. 498†; 7 (287); 8 (iv, 231*); 71 (XLB, 51); 70 (XXI, n.s., 402); *Peziza*—38 (Ed. 7, IV, 305); *Stamnaria Persoonii*—40 (iv, n.s., 185); 11 (321); 1 (II, 289 *Septogloeum Equiseti*, ? pycnidial stage); *Peziza Persoonii*—20 (201); 39 (pl. 162, 1825); 15 (698); 13 (319). On decaying *Equisetum* in moist places, spring and summer.
- **Stromatinia baccarum** (Schroet.) Boud. 28 (iv, 373; XVIII, 1); 115 (22); *Sclerotinia*—112 (146); 27 (XLVI, 299, 1908); Glasg. Nat. (I, 140); 8 (iv, 499); 40 (iv, n.s., 136, sclerotium only). *Monilia* stage on young shoots, ascophores on fallen fruits of *Vaccinium Myrtillus*.
- **fructigena** (Schroet.) Boud. 28 (iv, 373); 115 (22); *Sclerotinia fructigena* Aderh. & Ruhl. is now the usual citation—see 28 (xx, 103, for nomenclature and modern interpretation of brown rot fungi). The ascophore has not been found in Great Britain. The innumerable references in the literature apply to the *Monilia* stage though usually quoted under *Sclerotinia*: 93 (135, etc.); Wormald, 'Diseases of Fruits and Hops', 1939, gives a general account and numerous citations; 112 (144); 23 (xiv, 222; XXIV, 507; XXV, 209; XXXIX, 624); 22 (LXXXVIII, 50); 33 (XIX, 325, cytology; XLVII, 543, physiology); 31 (1915, 269*; 1944, 60); 28 (VI, 155; xv, 102); 8 (iv, 281); 56 (XIX, cxlii); 65 (XXX, 339); J. roy. Soc. N.S.W. (LXVIII, 154, for account of apothecial stage); 77 (1943, 56–8); Viennot-Bourgin, Les Champ. parasites, I, 725†, structure and pathology. On quince, pear, apple, plum, cherry, apricot, peach, etc., generally on fruit, sometimes on leaves, also on cob-nuts, Kingsdown, Kent.
- **pseudotuberosa** (Rehm) Boud. 28 (iv, 373); Boudier, Icones, pl. 480†; *Sclerotinia*—117 (LI, 62, microconidia); Viennot-Bourgin, Les Champ. parasites (I, 705—conidial stage is *Rhacodiella castanea*); *Ciboria*—7 (279); 8 (iv, 278); 28 (III, 302); 71 (XXXVIII, 133); *Hymenoscypha*—11 (119*); *Peziza*—14 (VIII, 102, 1880); *Ciboria Batschiana* (Zopf) Buchw. Friesia (III, 255). On decaying acorns.

- Stromatinia rapulum** (Bull. ex Fr.) Boud. 28 (iv, 372); Boudier, Icones, pl. 478†; 115 (22); *Sclerotinia*—7 (277); *Geophyxis*—Ramsbottom, Handbk., 186; 8 (iv, 384); *Peziza*—11 (50); 15 (666); 41 (pl. 50, fig. 197); 18 (365); 20 (189); *Peziza radicata*—44 (I, 21, 1785); 38 (Ed. 2, III, 436). On the ground amongst leaves.
- **subularis** (Bull. ex Fr.) Boud. 28 (iv, 373); as *Ciboria*—28 (iv, 72); 8 (iv, 277); *Hymenoscypha*—40 (iv, n.s., 137); 11 (122); *Peziza*—40 (vi, 163, 1881). On decaying fruit of *Angelica*, and on seeds of *Helianthus*, *Bidens*, etc.
- **temulenta** Prill. & Delacr. *Phialea*—Nature (CXLVI, 200 & 492, 1940; CLIII, 287) *Ciboria*—Friesia (III, 275). *Endoconidium temulentum* Prill. & Delacr. is the imperfect stage. Blind seed disease of *Lolium perenne*.

To be excluded

- Belonidium Campanula** (Nees) Boud. 20 (201); 58 (151); 51 (423, 1824). On stalks of decaying herbaceous plants. Doubtful records.
- Hymenoscypha ciborioides** (Fr.) Phill. 40 (iv, n.s., 136); 11 (117); *Peziza*—15 (697); 18 (370); 19 (vi, No. 158, 1841). No authentic specimen exists, but was retained by Phillips on the authority of Berkeley. On oak leaves.

LACHNELLACEAE

- Arachnopeziza aranea** (de Not.) Boud. 28 (iv, 375); 108 (VIII, Appendix, 113); Boudier, Icones, pl. 521†; 115 (25); *Dasyscypha*—8 (iv, 336); *Lachnella*—11 (272); *Peziza*—14 (VIII, 111, 1880); *Arachnoscypha* Boud.—Nannfeldt, Inop. Disc., 279†; Dennis (1949, 87). Inside fallen husks of *Castanea vesca*.
- **aurata** Fuckel 28 (iv, 375; VII, 293, development of fruit); Dennis (1949, 89); 100 (xxx, 662); *Tapesia*—7 (276); 8 (iv, 299). *Belonium rhabdospermum* (B. & Br.) Boud. q.v. is undoubtedly a synonym of this species. On dead wood.
- **aurelia** (Pers. ex Fr.) Fuckel 28 (iv, 375; VI, 300); Dennis (1949, 88); Boudier, Icones, pl. 520†; 108 (VIII, Appendix, 113); 71 (XXVIII, 133); Nannfeldt, Inop. Disc., 279; 100 (xxx, 661); *Tapesia*—27 (I, 191); 8 (iv, 299); 40 (iv, n.s., 182); 11 (280*); *Peziza*—15 (692); 13 (317); 18 (369); 20 (II, 199); *Peziza Wauchii*—65 (XII, 280); 39 (III, pl. 139, 1825); *Stictis Wauchii*—15 (737); 18 (375); *Patellaria bicolor*—45 (XXIV, 494*); 15 (719). Exs.: Phillips, 'Elev. Brit.', No. 29. On decaying beech and oak leaves, branches, etc.
- **nivea** Lort. 28 (VIII, 2, 1922; XIII, 260); 117 (xxx, 224); 108 (VIII, Appendix, 113); Dennis (1949, 89). On dead fallen branches.
- Cistella tapesioides** (Starb.) Nannf. Dennis (1949, 60). On rotten wood, probably oak, Reading, Berks.
- Dasyscypha abscondita** Massee in 37 (p. 46*, 1906); 28 (iv, 321). On fading grass under a cask.
- **acuta** (Vel.) Dennis (1949, 50). On rotting grass nr. Dumfries.
- **acutipila** (Karst.) Sacc. 28 (iv, 374); Dennis (1949, 51); Rev. mycol. (iv, n.s., 50†, affinities and structure); Boudier, Icones, pl. 511†; 115 (24); 8 (iv, 330); *Lachnella*—11 (252, 1887). On *Phragmites* and other grasses.
- **acuum** (Alb. & Schw. ex Fr.) Sacc. 28 (iv, 374); Dennis (1949, 33); 115 (24); 7 (269); 8 (iv, 337); *Lachnella*—40 (iv, n.s., 179); 11 (246); *Helotium*—15 (710); 13 (329); 18 (372); *Peziza*—18 (368, 1860). Exs.: Phillips, 'Elev. Brit.', No. 163. On decaying pine leaves.
- **bicolor** (Bull. ex Fr.) Fuckel 28 (iv, 374); 7 (268); Dennis (1949, 35); Boudier, Icones, pl. 501†; 115 (24); 71 (XXVIII, 133); 102 (iv, 236, morphology); 27 (I, 191); 8 (iv, 332); *Lachnum*—Nannfeldt, Svensk. Bot. Tidskr. xxxvi, 291; *Lachnella*—40 (iv, n.s., 179); 11 (249*); *Peziza*—27 (xvii, 363); 13 (312); 15 (685); 18 (368); 20 (II, 195); 55 (II, 691; IV, 467); 42 (pl. 17, 1796); as *Peziza pulchella*—58 (149); 51 (421); 92 (II, 33). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 568; Ed. 2, No. 363; Phillips, 'Elev. Brit.', No. 23. On dead branches of oak.
- **bicolor** var. **Rubi** (Bres.) Dennis (1949, 36). On dead canes of *Rubus idaeus*.
- **brevipila** Le Gal in Rev. mycol. (iv, n.s., 26); Dennis (1949, 11). On rotting wood.
- **brunneola** (Desm.) Sacc. 28 (iv, 374); 108 (VIII, Appendix, 113); Boudier, Icones, pl. 507†; *Lachnella*—11 (238); *Peziza*—46 (III, n.s., 67); 109 ('1874', publ. 1880, 67);

14 (III, 125, 1875); 19 (xv, No. 1482); as *D. fuscescens* p.p.—8 (IV, 348). Exs.: Phillips, 'Elv. Brit.', No. 28. On old oak and Spanish chestnut leaves.

Dasyscypha brunneola var. **fagicola** Phill. 28 (IV, 374); Rev. mycol. (IV, n.s., 28); Boudier, Icones, pl. 508†; Phillips in 11 (238, 1887). On beech mast.

— **callimorpha** (Karst.) Sacc. 28 (IV, 374); 8 (IV, 369, 'position doubtful'); Dennis 1949, 18; *Lachnella*—14 (xvi, 94, 1887; xviii, 84); 40 (III, n.s., 357; IV, n.s., 181 & 222). On dead leaves of *Carex* and *Eriophorum*.

— **calyciformis** (Willd.) Rehm 28 (VII, 79, 1921); 117 (xx, 232, pathology). On trunk of *Picea excelsa*, Kier, Stirlingshire, 1914 and near Peebles, 1920. A wound parasite.

— **calyculaeformis** (Schum. ex Fr.) Rehm 28 (IV, 374); Dennis (1949, 44, apparently most British specimens under this name are *Diplocarpha Curreyana*); 71 (xxviii, 133); 7 (272); 8 (IV, 349); *Lachnella*—40 (IV, n.s., 177); 11 (237); *Peziza*—13 (313); 15 (686); 19 (VII, No. 959, 1861; xviii, No. 1164). On branches of hazel, alder, etc.

— **calyculaeformis** var. **latebricola** Rehm 28 (IV, 374); 8 (IV, 349); 11 (237). On fallen branches of *Rhododendron* and *Vaccinium uliginosum*.

— **campylotrichi** A. L. Sm. 28 (III, 112*, 1909; IV, 374); Trans. Perthsh. Soc. nat. Sci. (VII, 20). According to Nannfeldt in 28 (xx, 194), this is *Unguiculaella eurotioides* (Karst.) Nannf. On thistle stalks.

— **caricis** (Desm.) Sacc. Dennis (1949, 16). On *Cladium mariscus*, Wheatfen, Norfolk.

— **carneola** (Sacc.) Sacc. Dennis (1949, 20). On *Molinia caerulea*, Wheatfen, Norfolk.

— **carneola** var. **longispora** Dennis (1949, 20). On dead leaves of grasses.

— **caulicola** (Fr.) Boud. 28 (XI, 5, 1926, 'probably'). Earlier records of this were apparently *D. clandestina* (Bull.) Fuckel q.v. On dead stems of *Pteris*.

— **cerina** (Pers. ex Fr.) Fuckel 28 (IV, 374); Dennis (1949, 44, as *D. cerinea*); 106 (IV, 219); Boudier, Icones, pl. 509†; 7 (272); 8 (IV, 352); *Lachnella*—71 (xxviii, 133); 40 (IV, n.s., 177); 11 (233*); *Peziza*—13 (313); 15 (685); *P. cerinea*—18 (368); 20 (II, 195); 51 (422, 1824). On dead wood, branches, etc.

— **ciliaris** (Schräd. ex Fr.) Sacc. 28 (IV, 374); Rev. mycol. (IV, n.s., 30); 115 (24); 7 (269); Dennis (1949, 27); 71 (xxviii, 133); 37 (1909, 375); 8 (IV, 335); *Lachnella*—11 (251); *Lachnum*—71 (xxxiv, 13), 15; *Peziza*—70 (I, n.s., 298); 13 (312); 15 (684); 18 (368); 19 (VII, No. 559, 1851); as *Lachnella echinulata*—40 (IV, n.s., 62 & 179); 11 (249); 71 (xxviii, 133); as *Peziza echinulata*—46 (III, 137*). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 573; Ed. 2, No. 373. On fallen leaves and wood of oak, beech, sweet chestnut.

— **clandestina** (Bull. ex Fr.) Fuckel 28 (IV, 374); Dennis (1949, 38); 115 (24); 70 (xxi, n.s., 402); 71 (xxviii, 133); 7 (272); 8 (IV, 350); *Lachnella*—40 (IV, n.s., 177); 11 (236); *Peziza*—70 (I, n.s., 298); 15 (686); 13 (313); 18 (368); 20 (II, 195); 58 (II, 149, 1831); as *Lachnella caulicola*—40 (IV, n.s., 177); 11 (236); as *Peziza caulicola*—13 (314); 15 (686); 18 (368); 19 (XIII, No. 310). On stems of dead bramble, willow and other plants.

— **comitessae** (Cooke) Sacc. 28 (IV, 374); 8 (IV, 355); *Lachnella*—40 (IV, n.s., 178); 11 (243); *Peziza*—Cooke in 14 (IV, 111, 1875); 40 (III, 201). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 371. On fallen trees.

— **conformis** (Cooke) Sacc. 28 (IV, 374; VI, 263*); Dennis (1949, 24); 115 (24); 7 (269); *Lachnella*—Cooke in 14 (xix, 107, 1891). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 375. On *Juncus*, and on dead grass roots and stems.

— **controversa** (Cooke) Rehm 28 (IV, 374); Dennis 1949, 19; 7 (271); 8 (IV, 347); *Lachnum*—28 (xxiii, 241); *Peziza*—14 (IV, 41†). Exs.: 43 (No. 70, 1875). On dead culms of various grasses.

— **crucifera** (Phill.) Sacc. 28 (IV, 374); Dennis (1949, 29); 106 (xxvii, 28); 7 (268); 115 (24); 100 (xxviii, 1); 8 (IV, 331); *Lachnum*—28 (xx, 194); Svensk. Bot. Tidskr. (xxxvi, 295); *Lachnella*—40 (IV, n.s., 179); 11 (250); *Peziza*—14 (VIII, 100); 109 ('1878', 114 & 120); 13 (313); Phillips in 31 (II, 10, 397, 1878). On fallen twigs of *Myrica Gale*; on hornbeam leaves and wings of fruits.

— **crystallina** (Fuckel) Sacc. 28 (VII, 59, 1921); Rev. mycol. (IV, n.s., 32†, structure and affinities); Dennis (1949, 47, 'has probably not previously been reported from Britain'). On dead stems of *Cnicus arvensis* and other herbaceous plants, Perth (Rea); on decorticated oak, King's Cliffe, Northants and Llandovery, Wales (Dennis).

— **diminuta** (Rob.) Sacc. 28 (IV, 374); 115 (24); 8 (IV, 344); *Lachnella*—40 (IV, n.s.,

- 179); **11** (253); *Peziza*—**13** (316); **14** (III, 184*, 1875). Exs.: Cooke, 'Fung. Brit.', No. 287 as *Peziza apala*. On dead stems of *Juncus*.
- Dasyscypha diplocarpa** (Curr.) Boud. **28** (iv, 374; VII, 293–8, paraphyses; XXIII, 241); Dennis (1949, 56); **115** (24); *Lachnella*—**11** (232*); *Peziza*—**15** (688); **27** (XVII, 363); **19** (XV₃, No. 1067); Currey in **45** (XXIV, 153*, 1863); *Diplocarpa Curreyana*—**7** (267); **8** (iv, 307); **35** (1901, 181); **100** (XXIX, 175). On wet rotten wood on the ground.
- **Eriophori** (Quél.) Sacc. Dennis (1949, 18). On dead *Eriophorum* leaves, W. Ross.
- **fascicularis** (Vel.) Le Gal Dennis (1949, 15). On dead branch, Masham, Yorks., in herb. Crossland at Kew.
- **Fragariasti** (Phill.) Mass. **28** (iv, 374); **8** (iv, 345); *Lachnella*—**14** (XX, 38); **46** (VI, n.s., 274 & 277, 1891, 'Phillips in litt.'). On dead strawberry leaves and stems.
- **fuscescens** (Pers. ex Fr.) Rehm **28** (iv, 374); Dennis (1949, 37); **115** (24); **7** (272); **8** (iv, 348); *Lachnella*—**11** (235); *Peziza*—**19** (XVII, No. 1622, 1876). On the under side of fallen beech leaves and beech mast, and on other leaves.
- **fuscescens** var. **fagicola** (Phill.) Dennis (1949, 38), = *Lachnella brunneola* var. *fagicola* Phill. q.v.—**11** (238). On leaves of *Quercus* and *Castanea*.
- **globuligera** Fuckel **28** (III, 230, 1910; iv, 374); as *Lachnella globulifera*—**46** (VI, n.s., 274, 1891). On decayed stems and wood.
- **granulosella** (v. Hoehn.) Dennis (1949, 30). On dead stems of *Carex riparia*, Wheatfen, Norfolk.
- **laetior** Karst. **28** (II, 94; iv, 374); **115** (24); **7** (268); **35** (5, 1904, as 'laeteor'); Dennis (1949, 52); Halifax Nat. (VIII, 90, 1904); *Lachnella acutipila* var. *laetior*—**11** (252, 1887); **40** (iv, n.s., 179). On dead canes of *Rubus idaeus*.
- **luteola** (Curr.) Sacc. **28** (iv, 374); *Helotium*—**115** (23); **28** (vi, 347; XVII, 156); **7** (281); **8** (iv, 240); *Lachnella*—**11** (248); **15** (710); **19** (XV₃, No. 1074); Currey in **45** (XXIV, 153*, 1863); = *Lachnum pygmaeum*—**28** (XXIII, 241); Amer. Midl. Nat. (XXVIII, 512, a revision of the species and full synonymy); *Dasyscypha pygmaeum*—Dennis (1949, 10); *Helolachnum aurantiacum* Torrend in Broteria, ser. Bot. (IX, 53, the basis of the new genus, *Helolachnum*, a 'Lachnum dépourvu de poils'). On gorse sticks, dead wood and branches in damp places.
- **nivea** (Hedw. fil. ex Fr.) Sacc. **28** (iv, 374); Dennis (1949, 46); **24** (XX, 367, ? parasite on heather); **115** (24); **71** (XXVIII, 133; XLB, 51); Rev. mycol. (iv, n.s., 39, synonymy and structure); **27** (I, 191); **8** (iv, 329); Ann. Mag. nat. Hist. (v, 1840); *Lachnella*—**40** (iv, n.s., 178); **11** (245); *Lachnum*—**71** (XXXI, 13), 15; *Peziza*—Proc. Belfast Nat. Fld Cl. (Appendix 1884, 309); **46** (II, pt. 1, 216); **13** (312); **27** (XVII, 363); **15** (685); **18** (368); **20** (II, 195); **44** (Fasc. 1, 21, 1785). Exs.: Cooke, 'Fung. Brit.', No. 559; Ed. 2, No. 546. On rotten sticks, old stumps, heather, etc.
- **nudipes** (Fuckel) Sacc. Dennis (1949, 15), treats *D. spiraeaeicola* (Karst.) Sacc. as a synonym. On *Spiraea ulmaria*.
- **nudipes** var. **minor** Dennis (1949, 15). On *Epilobium hirsutum*, Norfolk and Yorkshire.
- **papyracea** (Karst.) Sacc. Dennis (1949, 14). On decorticated wood, Swinton Park, Yorkshire.
- **patens** (Fr.) Sacc. **28** (iv, 374); Boudier, Icones, pl. 502†; *D. palearum*—**7** (271); **8** (iv, 347); Dennis (1949, 22); *Lachnella palearum*—**40** (iv, n.s., 178); **11** (239); *Peziza palearum*—**54** (III, 746); **13** (313); **14** (iv, 121, 1876). Exs.: **43** (No. 68). On straw, wheat, grasses.
- **patula** (Pers. ex Fr.) Sacc. **28** (iv, 374); Dennis (1949, 37); **115** (24); **7** (269); **102** (iv, 237, anatomy and morphology); **8** (iv, 333); *Lachnella*—**11** (251, 1887); *Dasyscyphus*—**120** (I, 671, 1821); *Peziza*—**106** (IX, 250). On decaying oak leaves.
- **perplexa** Boud. **28** (iv, 197, 1913; iv, 374); Trans. Perthsh. Soc. nat. Sci. (VII, 20); Boudier, Icones, pl. 510†. On dead root stocks and stems of *Dactylis glomerata*, nr. Perth.
- **pudibunda** (Quél.) Sacc. Dennis (1949, 14). On dead twigs of *Salix atrocinerea* and *Crataegus*.
- **pudicella** (Quél.) Sacc. Dennis (1949, 19). On grass stems, Wheatfen, Norfolk.
- **pulchella** Schroeter, Dennis (1949, 42). On fallen leaves of oak.
- **pulverulenta** (Lib.) Sacc. **28** (iv, 374); **7** (272); **8** (iv, 354); Dennis (1949, 42); *Lachnella solfatera*—**11** (246); *Peziza solfatera*—**46** (III, n.s., 67, 1880). On dead pine leaves.

- Dasyscypha rhodoleuca** (Sacc.) Sacc. Dennis (1949, 21). On decaying grass stems.
- **Rhytismatis** (Phill.) Sacc. **28** (iv, 72 & 374); **115** (24); Dennis (1949, 27); **7** (267); **8** (iv, 329); *Lachnum*—**28** (xxiii, 242); *Lachnella Rhytismae*—**11** (250); *Peziza Rhytismae*—Phillips in **14** (viii, 101, 1880); **40** (vi, 124); = *Lachnum echinulatum* (Awd.) Rehm, according to **7** (267). Also v. under *Dasyscypha ciliaris*. Parasitic on *Rhytisma acerinum*, and on oak leaves.
- **rorida** (Wallr.) Sacc. Dennis (1949, 26). On twigs (in herb. Crossland as *D. crucifera*) Masham, Yorks.
- **salicariae** Rehm Dennis (1949, 12). On base of dead stems of *Lythrum salicaria*, Wheatfen, Norfolk.
- **scintillans** Mass. **28** (iv, 374); **115** (24); **7** (267); Massee in **8** (iv, 328, 1895); = *D. capitata* (Peck) Le Gal—Dennis (1949, 36). On dead oak leaves.
- **Soppittii** Mass. **28** (iv, 374); Dennis (1949, 29); **106** (xxvi, 223; xxvii, 28); **115** (24); Massee in **8** (iv, 330*, 1895); **7** (268). On dead, fallen oak and sycamore leaves, etc.
- **Spiraeacola** (Karst.) Sacc. **28** (iv, 374); Boudier, Icones, pl. 506†; **7** (273, 1905); *Dasyscypha nudipes*—Dennis (1949, 15). On *Spiraea Ulmaria*, Yorkshire and Norfolk.
- **Stiginella** (Cooke) Sacc. **28** (iv, 374); **8** (iv, 369, 'position doubtful'); *Lachnella*—Cooke in **14** (xix, 86, 1891). On rushes.
- **Sydowii** Dennis (1949, 17). On dead leaves of *Eriophorum angustifolium*, Rushton, Staffs.
- **trichodea** (Phill. & Plowr.) Sacc. **28** (iv, 374); **37** (1907, 240); *D. trichiodea*—**8** (iv, 358); *Lachnella*—**11** (234); *Hyalotricha*—Dennis (1949, 76); *Peziza*—Phillips & Plowright in **14** (iii, 125*, 1875). Exs.: **43** (No. 69). On old pine needles.
- **virginia** (Batsch ex Fr.) Fuckel **28** (iv, 374); Dennis (1949, 12); Rev. mycol. (iv, n.s., 47†, structure and relationships); **115** (24); **7** (267); **102** (iv, 236, anatomy); **8** (iv, 327); **71** (xxviii, 133); **27** (I, 191); *Lachnum*—**71** (xxxib, 13), 6 & 10; *Lachnella*—**40** (iv, n.s., 179); **11** (248); *Peziza*—Proc. Belfast Nat. Fld Cl. (Appendix 1884, 309); **73** (iii, 75); **70** (I, n.s., 298); **27** (xvii, 363); **13** (312); **15** (684); **18** (368); Ann. Mag. nat. Hist. (v, 1840, 5); **20** (ii, 194); **58** (1831, 152) **51** (421); **92** (ii, 33); *Dasyscyphus*—**120** (I, 671); as *Peziza nivea*—**46** (ii, pt. I, 216); **55** (1817, 683); **38** (Ed. 2, iii, 435, 1792; Ed. 3, iv, 344; Ed. 7, iv, 302); **42** (pl. 65). Exs.: **43** (No. 21); Cooke, 'Fung. Brit.', Ed. 1, No. 560; Ed. 2, No. 545. On rotten branches, wood, herbaceous stems, etc.
- **virginia** var. **selecti** Karst. **28** (iv, 374); **14** (xviii, 84, 1890). On bark and cones of pine and fir.
- Erinella apala** (B. & Br.) Sacc. **28** (iv, 374; vi, 263*); **115** (24); **71** (xliib, 51; xxxib, 13), 6; xxviii, 133; **8** (iv, 303); **35** (359, 1898); *Lachnella*—**40** (iv, n.s., 180); **11** (253); *Peziza*—**15** (691); **13** (316); **18** (369); Berkeley & Broome in **19** (vii, No. 561, 1851); *Dasyscypha*—Dennis (1949, 25); Nannfeldt in **28** (xxiii, 242), states that this is a true *Lachnum*, the valid name being *L. apalum* (B. & Br.) Nannf., and that *Erinella juncicola* (Fuckel) Rehm is a synonym. Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 374; Phillips, 'Elv. Brit.', No. 27. On dead *Juncus* spp.
- **juncicola** (Fuckel) Sacc. **28** (iv, 374); Boudier, Icones, pl. 512†; **115** (24); **71** (xxviii, 133); **35** (359, 1898). According to Nannfeldt in **28** (xxiii, 242), this is a synonym of *Erinella apala* (B. & Br.) Sacc. On dead stems of *Juncus* spp.
- **pommeranica** Ruhl. **28** (iii, 113, 1909; iv, 374); Glasg. Nat. (I, 112); Trans. Buteh. nat. Hist. Soc. (vi, 84). On bark of *Pinus sylvestris*, Isle of Bute.
- Hyalopeziza ciliata** Fuckel Dennis (1949, 63). On fallen leaf of *Acer pseudoplatanus*, Congleton, Cheshire.
- Hyaloscypha candida** (Cooke) Boud. **28** (iv, 375); (Dennis (1949, 68, ? near *Dasyscypha nectrioides*); **115** (25); *Dasyscypha*—**8** (iv, 335); *Lachnella*—**11** (273); *Peziza*—Cooke in **14** (I, 130, 1873). On stems of *Rubus*.
- **dentata** (Pers. ex Fr.) Boud. **28** (iv, 375); *Mollisia*—**115** (26); **7** (290); **8** (iv, 207); *Calloria*—**11** (332, 1887); *Cistella*—Nannfeldt, Inop. Disc., 265. According to Massee in **8** (iv, 207), this is an *Orbilia*. On rotten wood.
- **farinacea** (Cooke & Mass.) Boud. **28** (iv, 375); *Pseudohelotium*—Cooke & Massee in **14** (xxi, 71, 1893). On willow bark.
- **hyalina** (Pers. ex Fr.) Boud. **28** (iv, 375); Dennis (1949, 69, in addition to the typical form, cites four other forms); **115** (25); **71** (xxxib, 13), 15; xlb, 51); **102** (iv, 239, morphology); *Dasyscypha*—**71** (xxviii, 133); **27** (I, 191); **8** (iv, 338); *Lachnella*—**40** (iv, n.s., 181); **11** (267*); *Peziza*—**15** (689); **13** (315); **18** (369); **20**

- (ii, 198, in pt.); *Octospora*—120 (i, 667, 1821); *Hyaloscyphus quercus* Nannf., nov. nom. —Inop. Disc., 274†. Exs.: 43 (No. 24). On chips, stumps, bark, etc.
- Hyaloscypha lachnobrachya** (Desm.) Nannf. Dennis (1949, 72) On dead leaves, nr. Rokeby.
- **lachnobrachya** var. **araneotincta** (Phill.) Dennis (1949, 73); v. *Lachnella araneotincta*. On dead leaves, Bristol.
- **leucella** (Karst.) Boud. 28 (iv, 324, 1914; iv, 375). On branch of *Alnus glutinosus*, near Aberdeen.
- **punctiformis** (Grev.) Boud. 28 (iv, 375); 115 (25); *Calycella*—Nannfeldt, Inop. Disc. (194†, relationship with Dermateaceae); *Helotium punctiforme*—7 (284); 8 (iv, 259); 40 (iv, n.s., 142); 11 (168); *Peziza punctiformis*—Greville in 39 (ii, pl. 63, 1823); *Helotium punctatum*—15 (715); 13 (332); 18 (372); *Peziza punctata*—51 (424); *Helotium populinum* Fuckel—Farlowia (i, 160†, 1943, a sketch is given of this species; the name '*H. populinum*' has become the 'dumping ground' for almost any species that might be described as punctiform. *Calycella Ilıcis* (Phill.) Boud. is regarded as another synonym). On dead leaves of oak, beech, etc.
- **punctoidea** (Karst.) Boud. 28 (iv, 375); 115 (25); *Dasyscypha*—8 (iv, 341); *Lachnella*—11 (268); *Peziza*—14 (v, 61, 1876). On dead leaves of *Epilobium*.
- **radio-striata** (Feltg.) Boud. 28 (vi, 329, 1920). On dead stems of *Symphytum officinale*, Perth.
- **straminea** (B. & Br.) Boud. 28 (iv, 375); 115 (25); *Mollisia*—7 (292); 8 (iv, 215); 11 (196); *Peziza*—36 (xxxv, 94); 15 (691); 18 (369); Berkeley & Broome in 19 (vii₂, No. 571, 1851). On dead sheaths of wheat and other Graminae.
- **vitreola** (Karst.) Boud. 28 (iv, 375); *Dasyscypha*—35 (183*, 1901); 28 (i, 196). On dead stems of blackberry.
- Hyalotricha corticola** Dennis (1949, 75). On dead branches and on bark of *Myrica* and *Betula*, respectively.
- Hypohosypha nuda** (Phill.) Boud. 28 (iv, 374); *Helotium*—8 (iv, 498); *Lachnella*—40 (iv, n.s., 179); 11 (247); *Peziza*—14 (viii, 101, 1880); 40 (vi, 124); Nannfeldt in 28 (xxiii, 244), states that apparently no specimen exists, but that the drawings in Herb. B.M. and descriptions indicate *Lachnum hygmaeum* (Fr.) Bres. On the ground amongst moss, in a fir wood.
- Lachnella albo-testacea** (Desm.) Quél. 28 (iv, 375); 11 (273); *Dasyscypha*—7 (271); Dennis (1949, 50); 8 (iv, 346); *Peziza*—15 (691); 18 (369); 19 (vii₂, No. 560, 1861). On dead grass stems.
- **araneo-cincta** Phill. 28 (iv, 375); 11 (271); *Dasyscypha*—8 (iv, 337); *Peziza*—Phillips in 46 (iii, 67, 1880); 14 (x, 68); 27 (xviii, 345); *Hyaloscypha lachnobrachya* var. *araneocincta* (Phill.) Dennis (1949, 73). Exs.: Phillips, 'Elv. Brit.', No. 169. On decaying birch leaves.
- **barbata** (Kze.) Fr. 28 (iv, 374); 40 (iv, n.s., 180); 11 (263, 1887); *Dasyscypha*—8 (iv, 361); Dennis (1949, 53). On dead stems of *Lonicera* and *Clematis*.
- **barbata** var. **pellita** Pers. 11 (263); *Peziza pellita*—46 (iii, 67, 1880); *Peziza barbata* var. *pellita*—14 (x, 67). On beech mast.
- **brunneo-ciliata** Phill. 28 (iv, 75 & 375); Phillips in 40 (v, n.s., 90, 1891). On dead culms of *Juncus squarrosus*, Orkneys.
- **canescens** (Cooke in litt.) Phill. 28 (iv, 374); 11 (259); *Dasyscypha*—27 (xlv, 169*); 71 (xxviii₂, 133); 7 (271); 8 (iv, 346); Nannfeldt in 28 (xx, 195), considers that the differences between this and *L. corticalis* Fr. are so slight that it 'falls within the variation shown by *L. corticalis*'; *Dasyscypha corticalis*—Dennis (1949, 39); *Acrotheca canescens* Grove is the conidial stage—27 (xlv, 169). On dead wood.
- **corticalis** [Pers.] Fr. 28 (iv, 374); Boudier, Icones, pl. 517†; 71 (xxviii₂, 133); 40 (iv, n.s., 180); 11 (258); *Dasyscypha*—Dennis (1949, 39) 7 (273); 8 (iv, 360); *Peziza*—13 (314); 15 (687); 18 (368); 19 (xiii, No. 311, 1844; vii₂, No. 562). Exs.: 43 (No. 117). On bark of poplar, and on roots.
- **Crosslandi** (Mass.) Boud. ap. Ramsb. 28 (iv, 375); *Echinella*—Massee in 8 (iv, 306); 7 (275); according to Nannfeldt in 28 (xx, 196; xxiii, 250), this is *Lachnum corticale* (Fr.) Nannf. with unusually well developed spores; *Dasyscypha corticalis*—Dennis (1949, 39). On decorticated wood.
- **horridula** (Desm.) Quél. 28 (iv, 375); *Dasyscypha*—7 (271); 8 (iv, 345, 1895); Dennis (1949, 54). On dry wheat straw.

- Lachnella inquilina** Karst. 28 (iv, 375); 115 (24); *Dasyascypha*—7 (268); Dennis (1949, 49); 35 (183, June 1901); 28 (i, 196). On *Equisetum* spp.
- **Laburni** Phill. 28 (iv, 76 & 375); Phillips in 40 (v, n.s., 90, 1891). On twigs of *Cytisus Laburni*.
- **leucophaea** (Pers. ex Weinm.) Boud. 28 (iv, 374); 106 (xxvii, 28); 115 (24); Boudier, Icones, pl. 514†; *Dasyascypha*—Dennis (1949, 41); 7 (272); 8 (iv, 351); *Lachnella sulphurea* var. *leucophaea*—40 (iv, n.s., 181); 11 (265); *Peziza* (*Lachnum*) *leucophaeum*—40 (vi, 123, 1881). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 372. On stems of nettles, Umbelliferae and *Artemisia*.
- **mollissima** (Lasch) Boud. British record based on J. Nannfeldt's identification of a specimen in Herb. C. E. Broome in Brit. Mus., gathered by Currey. On stem of *Arctium lappa*, April 1860.
- **nidulus** (Schm. & Kunze ex Fr.) Quél. 28 (iv, 375); Boudier, Icones, pl. 516†; 40 (iv, n.s., 180); 11 (264, 1887); 115 (24); *Dasyascypha*—Dennis (1949, 54); 8 (iv, 351); *Trichopeziza nidulus* var. *macrospora*—14 (xxi, 71). On dead stems of *Spiraea ulmaria*.
- **Nylanderii** (Rehm) Boud. 28 (iv, 375); 115 (24); *Erinella*—71 (xxxix, (13), 6); 7 (274); 8 (iv, 303, 1895, 'hitherto confounded with *Dasyascypha sulphurea*'). Exs.: Cooke, 'Fung. Brit.' No. 569. On herbaceous stems and on dead nettle stems.
- **orbicularis** Phill. 28 (iv, 75 & 375); Phillips in 40 (v, n.s., 89, 1891). On dead culms of *Juncus squarrosus*, Orkney.
- **plano-umbilicata** (Grev.) Phill. 28 (iv, 375); 40 (iv, n.s., 181); 11 (274); *Trichopeziza*—71 (xxviii, 133); *Peziza*—73 (iii, 175); 13 (315); 15 (690); 18 (369); 20 (ii, 198); Greville in 51 (420, 1824). A doubtful species. Phillips specimen in Herb. B.M. is a *Cyphella*. On dead nettles, etc.
- **prasina** Quél. 28 (iv, 375); Boudier, Icones, pl. 515†; 11 (261); *Lachnea*—35 (1894, 75); *Dasyascypha*—Dennis (1949, 53); 1 (273); 8 (iv, 359); *Peziza*—14 (xiii, 74); 46 (iv, n.s., 58*, 1883). On dead culms of *Phalaris arundinacea*, *Glyceria fluitans*, etc.
- **setulosa** (Mass. & Crossl.) Boud. 28 (iv, 375); *Echinella* Masee—37 (1909, 375); 7 (275); 8 (iv, 305); *Trichobelonium obscurum* Rehm—28 (xx, 196; xxiii, 249, this is the legitimate name according to Nannfeldt). On old stems of *Calluna vulgaris*.
- **siparia** (B. & Br.) Phill. 28 (iv, 374); 11 (276); *Dasyascypha*—8 (iv, 367); *Peziza*—15 (696); 18 (370); Berkeley & Broome in 19 (xiii, No. 772, 1854); *Encoelia siparia* (B. & Br.) Nannf.—28 (xx, 196). On decorticated elm branches.
- **spadicea** (Pers. ex Fr.) Phill. 28 (iv, 374); 11 (258, 1887); *Dasyascypha*—8 (iv, 363). On dead stems of *Ulex*, *Populus*, *Tilia*.
- **sulphurea** (Pers. ex Fr.) Quél. 28 (iv, 374); Boudier, Icones, pl. 513†; 115 (24); 40 (iv, n.s., 181); 11 (264); *Lachnum*—71 (xxxix, (13), 15); *Dasyascypha*—Dennis (1949, 43); 71 (xxviii, 133); 106 (iv, 219); 8 (iv, 352); *Peziza*—46 (ii, pt. 1, 216); 13 (315); 73 (iii, 75); 27 (xvii, 363); 15 (689); 18 (369); 20 (ii, 198); 51 (420); 39 (ii, 83*); 120 (i, 665); *Peziza hydroides*—58 (1831, 150); 55 (1817, 691; 1821, 467); 42 (pl. 178, 1798). Exs.: 43 (No. 25). On dead herbaceous stems, etc.
- **tricolor** (Sow. ex Fr.) Phill. 28 (iv, 374; xxiii, 245); 115 (24); 11 (240); *Dasyascypha*—Dennis (1949, 56); 8 (iv, 364); *Peziza*—15 (687); 18 (368); 20 (ii, 204); 120 (i, 671); Sowerby in 42 (pl. 369, fig. 6, 1802); *Peziza Godroniana*—18 (368). On bark and wood, especially of oak.
- Micropodia arenula** (Alb. & Schw. ex Fr.) Boud. 28 (xiii, 260, 1928); Boudier, Icones, pl. 528†. On dead fronds of *Pteris*, Worcs.
- **aspidicola** (B. & Br.) Boud. 28 (iv, 376); 115 (25); *Dasyascypha*—71 (xxviii, 133); 8 (iv, 338); *Lachnella*—11 (245); *Peziza*—15 (691); 46 (iii, n.s., 67); 18 (369); Berkeley & Broome in 19 (xiii, No. 771, 1854); Nannfeldt in 28 (xxiii, 245), agrees with von Hoehnel that this is identical with *Peziza chrysostigma* Fr. q.v. Exs.: Cooke, 'Fung. Brit.', No. 565; Ed. 2, No. 547; Phillips, 'Elv. Brit.', No. 26. On dead stems of ferns, especially *Nephrodium Filix-mas*, also on *Pteris aquilina* and *Equisetum*.
- **Bullii** (W. G. Sm. ap B. & Br.) Boud. 28 (iv, 375); *Dasyascypha*—7 (274); 8 (iv, 366); *Mollisia*—11 (194); *Peziza*—14 (i, 120*); 31 (1872, p. 1623*); 19 (viii, No. 1324, with fig., 1871). On a wooden cistern, and on dead tree.
- **chrysostigma** (Fr.) Boud. 28 (iv, 375); 115 (25); *Calloria*—40 (iv, n.s., 186); 11 (328, 1881); *Mollisia*—71 (xxviii, 133); 8 (iv, 218, according to Masee, *Peziza flaveola* Cooke is a synonym of this, but see Nannfeldt under *Urceolella flaveola* and *Macropodia aspidicola*. On dead fronds of fern and bracken.

- Micropodia concolor** (Phill.) Boud. 28 (iv, 375). *Helotium*—7 (283); 8 (iv, 247); *Hymenoscypha*—40 (iv, n.s., 139); 11 (139); *Peziza*—13 (321, 1879); 14 (viii, 102). On wood.
- **думорум** (Desm.) Boud. 28 (iv, 375); *Hymenoscypha*—71 (xxxib, (13), 6 & 13); *Dasyyscypha*—Dennis (1949, 33); 8 (iv, 357); *Lachnella*—11 (261, 1887). On underside of dead bramble leaves.
- **filicea** (Cooke & Phill.) Boud. 28 (iv, 375); *Dasyyscypha*—8 (iv, 331); *Lachnella*—11 (254, 1887); 40 (iv, n.s., 180). On ferns, Duneden and Cheddar.
- **grisella** (Rehm) Boud. 28 (iv, 375); Glasg. Nat. (vii, 6); *Dasyyscypha*—8 (iv, 368); *Helotium*—40 (iv, n.s., 172); *Lachnella*—40 (iv, n.s., 222, 1890); 46 (vi, n.s., 194); 14 (xviii, 84, 1890); *Microscypha grisella* (Rehm) H. & P. Syd.—Nannfeldt, Inop. Disc., 276†; Dennis (1949, 85). On the under surface of dead bracken fronds.
- **hyalina** (Phill.) Boud. 28 (iv, 375); *Dasyyscypha hyalina* (Phill.) Saccardo Syll. Fung. (viii, 449); *Dasyyscypha luzulina*—8 (iv, 344); *Lachnella luzulina*—40 (iii, n.s., 357; iv, n.s., 178); 11 (244); *Peziza luzulina*—Phillips in 14 (iv, 121*, 1876); 46 (vi, n.s., 33). Exs.: 43 (No. 71). On the base of dead leaves of *Luzula sylvatica*.
- **oedema** (Desm.) Boud. 28 (iv, 375); *Dasyyscypha*—8 (iv, 357); *Lachnella*—40 (iv, n.s., 181); 11 (271); *Peziza*—14 (viii, 101); 13 (317, 1879); as *Peziza epiphragmidium*—in Herb. Phillips (B.M.). Seated on *Phragmidium* on decayed leaves of *Rubus*.
- **pteridina** (Karst.) Boud. 28 (iv, 375; xi, 5); 115 (25); 70 (xxi, 402); Boudier, Icones, pl. 527†; *Mollisia*—7 (292); 35 (28*, 1899). On stems of ferns and bracken.
- Mollisia acerina** (Mont.) v. Hoehn. Mitt. bot. Lab. tech. Hochsch. Wien (iii, 65–66). British record based on C. E. Broome's specimen in B.M. Herb. and identified by J. A. Nannfeldt in 1932. Also Dennis (1949, 85). On leaves of *Acer pseudoplatanus*, Batheaston, 1864. (Regarded as oak by C.E.B.)
- Pezizellaster serrata** (Hoffm. ex Fr.) Dennis (1949, 62). On the inner surface of bark of *Sorbus Aucuparia*, Yorkshire.
- Pithyella erythrostigma** (B. & Br.) Boud. 28 (iv, 375); *Lachnella*—11 (254); 8 (iv, 370, 'excluded species'); *Peziza*—15 (705); Berkeley & Broome in 19 (xviii, No. 1168, with fig., 1866). Parasitic on *Sphaeria phaeostroma*.
- **hydnicola** (B. & Br.) Boud. 28 (iv, 375); *Mollisiella*—8 (iv, 223); *Mollisia*—11 (194); *Peziza*—Berkeley & Broome in 19 (vii, No. 1327, with fig., 1871); 14 (i, 131). Nannfeldt in 28 (xx, 202), examined the type in Herb. B.M. and found that it did not grow on *Hydnum* but through a resupinate *Hydnum*, the substratum probably being oak. The fungus he says is *Corynella atro-virens* (Pers.) Boud.
- **Hypnorum** (Fr.) Boud. 28 (iv, 375); ? *Mollisiella*—115 (26); ? *Mollisia*—7 (293); Halifax Nat. (vi, 124, 1902)=? *Mollisiella* q.v. Among mosses and liverworts on a wall.
- **ilicicola** (B. & Br.) Boud. 28 (iv, 375); *Mollisiella*—100 (xxxi, 95); 8 (iv, 222); *Mollisia*—11 (193); 40 (iv, n.s., 174); *Peziza*—36 (xxxi, 522*); 13 (316); 15 (692); Berkeley & Broome in 19 (vii, No. 958, with fig., 1861). On holly and on *Myriangium* growing on holly.
- Trichopeziza asema** (Phill.) Sacc. 28 (iv, 376); 115 (25); *Lachnella*—Phillips in 14 (xix, 73, 1891); *Dasyyscypha 'ascuna'*—7 (269); 8 (iv, 336); 37 (375, 1909). On dead *Carex*.
- **caesia** (Pers. ex Fr.) Boud. 28 (v, 2, 1915; xii, 290, synonymy and structure); as *Mollisia caesia* (Fuckel) Sacc.—28 (vii, 297); *Ereopeziza*—Dennis (1949, 86) = *Chavetiae* (Lib.) Boud. *Peziza*—15 (693); 18 (369); 19 (vii, No. 565, 1851). On fallen logs and oak chips.
- **carinata** Cooke & Massee in 14 (xxi, 121, 1893); 28 (iv, 376); 115 (25); *Dasyyscypha*—7 (270); 7A (1909, 290); 8 (iv, 339*); *Lachnella*—35 (1894, 170). Nannfeldt in 28 (xxiii, 251), regards this as inseparable from the octosporous main form of *Unguicularia Winteriana* (Rehm) Nannf. On decaying fern stems.
- **citricolor** (B. & Br.) Sacc. 28 (iv, 376); *Dasyyscypha*—7 (273); 35 (1898, 359; 1901 186); 8 (iv, 356); *Lachnella*—11 (260); *Peziza*—14 (i, 129); Berkeley & Broome in 19 (vii, No. 1321, with fig., 1871). On rotten wood and twigs.
- **dematricula** (B. & Br.) Sacc. 28 (iv, 376); *Dasyyscypha*—48 (xx, 142); 27 (i, 191); 7 (274); 8 (iv, 364 p.p.); *Lachnella*—11 (265); *Peziza*—15 (705); Berkeley & Broome in 19 (xv, No. 1070, with fig., 1865); *Hyaloscypha*—28 (xx, 205); 35 (1948, No. 825, 75); Dennis (1949, 66). On dead wood and dead stems of rose, bramble and oak chips.

- Trichopeziza episphaeria** (Mart.) Lamb. 28 (iv, 376); *Lachnella*—40 (iv, n.s., 181); 11 (273); 8 (iv, 370, 'as excluded species'); *Peziza*—27 (xvii, 364); 13 (315); 15 (689); 18 (368); 20 (ii, 197, 1836). On *Hypoxylon multifforme*.
- **eriobasis** (Berk.) Boud. 28 (iv, 376; v, 16); 115 (25); *Tapesia*—8 (iv, 300); 11 (278); *Peziza*—36 (xxx, 515*); 15 (693); 18 (369); Berkeley in 19 (xiii, No. 312, 1844). On inner side of bark.
- **escharodes** (B. & Br.) Boud. 28 (iv, 376, as 'escharoides'); *Lachnella*—40 (iv, n.s., 180); 11 (263); 13 (316); *Peziza*—Berkeley & Broome in 19 (vii, No. 1322, with fig., 1871); 27 (xviii, 364); as *Dasyscypha dematiicola*—8 (iv, 363 p.p.). On stems of *Rubus* and *Rosa*.
- **flavo-fuliginea** (Alb. & Schw. ex Fr.) Sacc. 28 (iv, 376). Trans. Perthsh. Soc. nat. Sci. (vii, 22); *Dasyscypha*—28 (iii, 288, 1911; iv, 12). On old elm stumps, near Perth.
- **Grevillei** (Berk.) Sacc. 28 (iv, 376); 106 (xxvii, 28); *Dasyscypha*—115 (24); Dennis (1949, 31); 7 (273); 8 (iv, 359); *Mollisia*—40 (iv, n.s., 172); 11 (180); *Peziza*—15 (690); 13 (315); 18 (369); 20 (ii, 198); as *Peziza nidulus*—51 (420, 1824); 58 (149). Nannfeldt in 28 (xxiii, 251), suggests that *Lachnum brevipilum* v. Hoehn. and *Peziza Berkeleyi* Blox. ap. B. & Br. may be synonyms of this. On dead stems of Umbelliferae.
- **trabilennoides** (Rehm) Boud. 28 (iv, 376); *Dasyscypha*—28 (i, 72, 1899). On dry decorticated beech wood, Gomshall.
- Trichoscypha Abietis** (Karst.) Boud. 28 (iv, 375); *Dasyscypha*—8 (iv, 343); 64 (xxix, 184); *Peziza calycina* var. *Abietis*—13 (312); 15 (685). On *Abies excelsa*.
- **calycina** (Schum. ex Fr.) Boud. [?= *Dasyscypha calyciformis* (Willd.) Rehm] 28 (iv, 375); 115 (25); 106 (xxvii, 28); Boudier, *Icones*, pl. 518*; *Trichoscyphella*—Nannfeldt, *Inop. Disc.*, 299; *Lachnella*—40 (iv, n.s., 178); 11 (241 p.p.); *Dasyscypha*—100 (xxvi, 76, for a discussion of the taxonomy); 71 (xxviii, 133); 76 (i, 11, and references in other vols.); 56 (xiv, 143; xxvii, 734); 65 (xii, 278); *Peziza*—23 (i, 52; ix, 176); 27 (xvii, 363); 70 (i, n.s., 298) *Proc. Belfast Nat. Fld Cl.* (Appendix 1884, 309); 46 (ii, pt. 1, 216); 13 (312); 15 (685); 14 (iv, 169) 18 (368); 20 (ii, 195); *Peziza calyciformis*—38 (Ed. 3, iv, 345, 1796). Some of the older references have been omitted as it is not possible to be certain what fungus was intended. The name *Dasyscypha calycina* has been used (a) for a small spored fungus which may be synonymous with *D. calyciformis* (Willd.) Rehm, occurring on larch, pine, *Abies* and *Picea* (e.g. Boudier, Nannfeldt); (b) as a synonym of *D. Willkommii*, a large spored form found exclusively on larch (e.g. Massee, Hiley, Brooks); (c) in Fuckel's sense for a large spored fungus distinct from (b) and occurring on larch and pine (e.g. Viennot-Bourgin, Hahn & Ayers); and (d) indiscriminately for any of these fungi. Note the following references which include discussions of the nomenclature and taxonomy of these confused species: 14 (iv, 169); 65 (xii, 278); W. H. Hiley, *The fungal Diseases of the Common Larch*, Oxford, 1919; 100 (xxvi, 76; xxxv, 95); Nannfeldt, 1932, p. 299; Viennot-Bourgin, *Les Champ. parasites*, 1949, p. 683; Dennis (1949, 92, for a revision of British *Trichoscyphella* spp.). On species of larch, fir and pine.
- **calycina** var. **Trevelyani** (Cooke) Boud. 28 (iv, 375); *Dasyscypha*—8 (iv, 342); *Glasg. Nat.* (iv, 18); *Lachnella*—11 (242); *Peziza*—Cooke in 14 (iii, 121, 1875). According to Nannfeldt in 28 (xx, 204), the type specimen of this variety is *Trichoscypha Willkommii* (Hart.) Nannf. On larch.
- **resinaria** (Phill.) Boud. 28 (iv, 375); 115 (25); *Trichoscyphella*—Dennis (1949, 93); *Dasyscypha*—56 (xxvii, 734); 64 (xvii, 25; xxix, 184); 23 (ix, 182*; xii, 308*); 7 (271); 8 (iv, 343); *Lachnella*—11 (242); *Peziza*—Phillips in 14 (iii, 185, 1875). Exs.: 43 (No. 66). Causing canker of spruce.
- **subtillissima** (Cooke) Boud. 28 (iv, 375); 115 (25); *Dasyscypha*—27 (i, 191); 23 (ix, 185); 8 (iv, 342); 64 (xvii, 25; xxix, 184); *Lachnella*—40 (iv, n.s., 178); 11 (244); *Peziza*—13 (312); Cooke in 14 (iii, 121, 1875); 28 (xxv, 303); Dennis 1949, 92 regards this as a synonym of *T. calycina* (Schum. ex Fr.) Nannf. On pine, larch and fir as saprophyte.
- **Willkommii** (Hartig) Boud. 28 (iv, 375); *Trichoscyphella*—Nannfeldt, *Inop. Disc.*, 300; *Dasyscypha*—100 (xxvi, 81); 71 (xxxix, (13), 15); Viennot-Bourgin, *Les Champ. parasites*, (i, 683*); 56 (xviii, 1-5, general account of canker); 64 (xxix, pt. 2, 184-7, general account of canker; many references in other vols.); *Peziza*—72 (i, 24); 25 (iii, 20; x, 37); 57 (v, 23*); as *Dasyscypha calycina*—8 (iv, 342); 56 (xxix, 390); 112 (125); 7 (270); 89 (228*); *Ann. Mag. nat. Hist.* (v, 5, 1840); as *Lachnella*

- calycina* p.p.—40 (iv, n.s., 178); 11 (241). Owing to confusion with *D. calycina* the first record of this fungus is uncertain. Causing a canker on spp. of larch.
- Urceolella Arundinis** (Fr.) Boud. 28 (iv, 376); *Peziza* (*Mollisia*) *arundinis*—two specimens of W. Phillips in Herb. B.M. Honour Park Pool, May 1878.
- aspera** (Fr.) Boud. 28 (iv, 167 & 376); Dennis (1949, 82); Boudier, Icones, pl. 533†; 71 (xxxiv, 13), 6 & 10, 1912). On dead stems of *Osmunda*, Clare Island.
- Berkeleyi** (Blox.) Boud. 28 (iv, 376); *Dasyscypha*—8 (iv, 358); *Lachnella*—11 (270); *Peziza*—27 (xvii, 363); 15 (690); 18 (369); Bloxam in 19 (xiii, No. 770, 1854). Nannfeldt in 28 (xxiii, 251), considers that this is hardly distinct from *Lachnum brevipilum* v. Hoehn., and that whether it is distinct from *Peziza Grevillei* Berk. and from *Calloria canticola* Cooke & Phill. ap. Phill. is extremely doubtful. On dead stems of Umbelliferae.
- deparcula** (Karst.) Boud. 28 (iv, 376; vii, 60); 115 (25); *Hyaloscypha*—Dennis (1949, 74); *Belonidium*—71 (xxxiv, 13), 6); 35 (1907, 350); 7 (288); 8 (iv, 497); *Helotium*—14 (xx, 38); 46 (vi, n.s., 274, 1891). On dead stems and petioles of *Spiraea ulmaria*.
- effugiens** (Desm.) Boud. 28 (iv, 376); 115 (25); *Mollisia*—7 (291); 8 (iv, 211); 11 (196, 1887); *Trichopeziza*—Rev. mycol. (iv, n.s., 54, taxonomy). On dried stems of herbaceous plants.
- elaphines** (B. & Br.) Boud. 28 (iv, 376); *Dasyscypha*—7 (274); 8 (iv, 366); *Mollisia*—40 (iv, n.s., 172); 11 (179); *Peziza*—36 (xxxv, 90); 13 (323); Berkeley & Broome in 19 (vii, No. 1325, with fig., 1871). According to Nannfeldt in 28 (xx, 205), this is *Unguicularia scrupulosa* (Karst.) von Hoehn. Dennis (1949, 81) adopts Nannfeldt's synonymy). On rotten wood and stems of *Heracleum*, on decorticated twig, etc.
- flaveola** (Cooke) Boud. 28 (iv, 376); *Hyaloscypha*—Dennis (1949, 75); *Mollisia*—71 (xxviii, 133); 11 (192); Cooke in 14 (i, 131, 1873); *Mollisia chrysostigma*—8 (iv, 218); *Hyaloscypha*—28 (xxiii, 251, Nannfeldt regards *Calloria chrysostigma* sensu Phill., *Mollisia chrysostigma* sensu Massee (but not *Peziza chrysostigma* Fr. or *Helotium chrysostigma* Karst.) and *Mollisia versicolor* sensu Phill. as synonyms). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 550. On bracken.
- fugiens** (Phill.) Boud. 28 (iv, 376); 115 (25); *Dasyscypha*—Dennis (1949, 34); 115 (24); 35 (1907, 254); 8 (iv, 341); *Peziza*—27 (xx, 62); Phillips in 46 (iii, 137*, 1881). On damp, rotting rushes.
- incarnatina** (Quél.) Boud. 28 (iv, 167 & 376); Boudier, Icones, pl. 531†; 71 (xxxiv, 13), 15, 25, 1912); *Unguicularia*—Dennis (1949, 80). On decaying stalks of *Cirsium oleraceum*, Clare Island.
- Iridis** Rea in 28 (vi, 330*, 1920). On decaying leaves of *Iris pseudacorus*, Perthshire.
- leuconica** (Cooke) Boud. 28 (iv, 376; vii, 298); 115 (25); *Hyaloscypha*—28 (xx, 206); Dennis (1949, 67); *Dasyscypha*—115 (24); 71 (xxxiv, 13), 15); 27 (i, 191); 37 (1909, 375); 8 (iv, 334); *Lachnella*—40 (iv, n.s., 181); 11 (267); *Peziza*—Cooke in litt. 13 (317, 1879). On *Calluna*, and wood of *Pinus* and *Taxus*.
- leucostoma** (Rehm) Boud. 28 (vi, 329, 1920). On dead stems of *Oenanthe crocata*.
- Mali** (Rehm) Boud. 28 (iv, 376); *Mollisia*—8 (iv, 206); 11 (194); *Peziza*—14 (xiii, 74, 1885); *Cistella Mali* (Rehm) Nannfeldt—Inop. Disc., 273. On bark of dead holly and apple tree.
- melaxantha** (Fr.) Boud. 28 (iv, 376); 115 (25); *Dasyscypha*—7 (272); 8 (iv, 353); *Lachnella*—40 (iv, n.s., 181); 11 (266); 46 (vi, 194); *Peziza*—13 (314); 15 (687); 18 (368); 20 (ii, 196, 1836). On fallen branches of beech.
- micacea** (Pers. ex Fr.) Boud. 28 (iv, 376); *Dasyscypha*—8 (iv, 360); *Lachnella*—11 (269); *Peziza*—46 (iii, n.s., 137, 1881). On dead stems of thistle.
- papillaris** (Bull. ex Fr.) Boud. 28 (iv, 13 & 376); Boudier, Icones, pl. 529†; *Dasyscypha*—71 (xxviii, 133); 7 (273); 8 (iv, 361); Proc. Belfast Nat. Fld Cl. (Appendix 1884, 309); *Lachnella*—40 (iv, n.s., 180); 11 (257); *Peziza*—15 (689); 13 (315); 18 (369); 20 (ii, 197); 120 (666); 42 (pl. 177, 1798); *Lachnella varicolor*—11 (259); 13 (314); 15 (688); 18 (368); 20 (ii, 197). On rotten wood.
- paulula** (Rob. & Desm.) Boud. 28 (iv, 376); *Pseudopeziza*—8 (iv, 196); *Mollisia*—11 (186); *Peziza*—15 (705); 19 (vii, No. 960, 1861). On dead culms of *Juncus maritimus* and other spp.
- Pteridis** (Alb. & Schw. ex Fr.) Boud. 28 (iv, 376; xvii, 1); *Dasyscypha*—Dennis (1949, 32); Glasg. Nat. (vii, 6); 7 (274); 8 (iv, 368); *Lachnella*—11 (256*); *Peziza*—

- 14 (I, 155, 1873); 54 (IV, 731); 27 (XVII, 264). On dead stems of *Pteris aquilina*, *Nephrodium Filix-mas*.
- Arceolella puberula** (Lasch) Boud. 28 (IV, 376); 115 (25); *Hyaloscypha*—Dennis (1949, 73); *Dasyscypha*—7 (272); 8 (IV, 355); *Lachnella*—14 (XVIII, 85, 1890); *Helotium*—27 (XI, 32, 1873); Farlowia (I, 169†). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 574. On decaying leaves of oak.
- **Richonis** Boud. 28 (IV, 376); 115 (25); Boudier, Icones, pl. 534†; *Dasyscypha Richonii*—7 (274); 35 (341, 1900; 1901, 186); 28 (I, 152); *Hyaloscypha Richonis* (Boud.) Dennis 1949, 66. On rotten wood, Whitby, Yorkshire.
- **scrupulosa** (Karst.) Boud. 28 (IV, 376); *Ungicularia*—Dennis (1949, 81); *Dasyscypha*—7 (274); 8 (IV, 365); *Lachnella*—11 (272); *Peziza*—14 (XIII, 73, 1885); —as *Peziza tonipora* Phillips in Herb. On dead thornwood and *Rubus Idaeus*, etc.
- **spirotricha** (Oud.) Boud. 28 (IV, 376); *Lachnella*—11 (266); *Peziza*—43 (No. 167); 14 (x, 68); *Ungicularia*—28 (XXIII, 248); *Dasyscypha asterostoma*—8 (IV, 339); 27 (L, 191); *Peziza asterostoma*—14 (VII, 140, 1879); *Hyalotricha*—Dennis (1949, 77, synonymy given). On dead herbaceous stems.
- **stereicola** (Cooke) Boud. 28 (IV, 376); 27 (XXIII, 134); *Cistella*—Dennis (1949, 60); *Dasyscypha*—8 (IV, 356); *Calloria*—40 (IV, n.s., 186); 11 (328); *Peziza*—13 (317); Cooke in 14 (I, 130, 1873). Exs.: 43 (No. 186). On the hymenium of *Stereum*.
- **Stevensoni** (B. & Br.) Boud. 28 (IV, 376); *Dasyscypha*—8 (IV, 364); *Lachnella*—40 (IV, n.s., 177); 11 (235); *Peziza*—14 (III, 122); 13 (324); Berkeley & Broome in 19 (XIV, No. 1485, 1875); *Hyaloscypha*—28 (XX, 206, for synonymy); Dennis (1949, 71). On decorticated wood.
- **Tami** (Lamy) Boud. 28 (IV, 376); *Dasyscypha*—8 (IV, 340); *Peziza*—27 (XVII, 363, 1879); *Pezizellaster*—Dennis (1949, 61). On dead stems of *Tamus communis*.
- **Tami** var. **Humuli** (Phill.) Boud. 28 (IV, 376); *Lachnella*—Phillips in 11 (270, 1887); *Dasyscypha Tami*—8 (IV, 340). On *Humulus Lupulus*.
- **versicolor** (Desm.) Boud. 28 (IV, 376; XXII, 1); 115 (25); *Mollisia*—7 (293); 8 (218); 40 (IV, n.s., 174); 11 (195); *Peziza*—14 (VIII, 102); 13 (325, 1879); *Allophyllaria*—Nannfeldt, Inop. Disc., 266. On dead fronds of *Pteris aquilina* and *Nephrodium*.
- **viburnicola** (B. & Br.) Boud. 28 (IV, 376); *Mollisia*—8 (IV, 213); 11 (185); *Peziza*—15 (706); Berkeley & Broome in 19 (XVIII, No. 1170, 1866); *Pyrenopeziza commoda* (Rob.) Nannf.—Inop. Disc., 144†; 28 (XXIII, 252). Exs.: 43 (No. 85); Cooke, 'Fung. Brit.', Ed. 1, No. 656; Ed. 2, No. 385. On dead leaves of *Viburnum*.

MOLLISACEAE

- Coronellaria amaena** Boud. 28 (III, 124, 1909; IV, 377) Boudier, Icones, pl. 537†. On dead stems of rushes and grasses, Lincolnshire.
- Ephelina Prunellae** Phill. ex A. L. Sm. 28 (III, 48 & 114, 1908; IV, 377); Glasg. Nat. (I, 33); Trans. Butesh. nat. Hist. Soc. (VI, 84); *Beloniella Prunellae* Lind.—102 (V, 274); 1 (II, 140). According to Nannfeldt in 28 (XXIII, 242), the valid name is *Fabraea Brunellae* (Lind) Nannf. as Lind's description was published a year earlier. Conidial stage is *Asteroma Prunellae* Purt. On *Prunella vulgaris*, stems and leaves.
- **Rhinanthi** (Phill.) Sacc. 28 (IV, 377); *Ephelis*—40 (IV, n.s., 189); 11 (358*); *Rhytisma radicalis* Cooke—14 (VIII, 9, 1879); *Ephelina radicalis*—8 (IV, 75*); Glasg. Nat. (II, 94); *Ephelina lugubris* (de Not.) v. Hoehn.—Nannfeldt, Inop. Disc., 87†. On stems near base, and roots of *Rhinanthus Crista galli*.
- Mollisia aquosa** (B. & Br.) Phill. 28 (IV, 377); 115 (26); 7 (289); 8 (IV, 206); 11 (172); *Peziza*—14 (I, 130); Berkeley & Broome in 19 (VII, No. 1326, with fig., 1871). According to Nannfeldt in 28 (XXIII, 246), this is a synonym of *M. ligni* (Desm.) Karst. On or with *Lasiosphaeria hirsuta*, and on willow.
- **atrata** (Pers. ex Fr.) Karst. 28 (IV, 377); 115 (26); 27 (L, 192); 71 (XXVIII, 133; XXXI, (13), 6); 7 (290); 8 (IV, 208); 40 (IV, n.s., 172); 11 (181); *Peziza*—27 (XVII, 364); 13 (323); 15 (704); 18 (371); 20 (II, 207); 58 (148, 1831); *M. atrata* var. *ulmariae*—40 (IV, n.s., 172); 11 (182); *Peziza atrata* var. *ulmariae*—13 (323); *Mollisia atrata* var. *Eupatoricola*—8 (IV, 209); *Peziza atrata* var. *eupatoricola*—43 (No. 179); *Peziza ulmariae*—15 (703). Exs.: Berkeley, No. 68; Cooke, 'Fung. Brit.', No. 284; No. 399. On dead stems of herbaceous plants.

- Mollisia atrata** var. **Asparagi** Wint. 28 (iv, 377); 8 (iv, 209); 11 (182, 1887); = *Pyrenopeziza atrata* (Nyl.) Nannf. probably. On dead stems of *Asparagus*.
- **atrata** var. **Oenanthes** Phill. 28 (iv, 377); 11 (182); 43 (No. 178, 1881). On dead stems of *Oenanthe crocata*.
- **atro-cinerea** (Cooke) Phill. 28 (iv, 377); Rev. mycol. (iv, n.s., 56); 115 (26); 71 (xxviii, 135); 27 (L, 192); 7 (290); 8 (iv, 208*); 11 (176); *Peziza*—65 (xii, 280, 1875). Nannfeldt in 28 (xx, 198), regards this as a synonym of *Mollisia Polygoni* (Lasch) Rehm. Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 284. On stems of *Polygonum aviculare*, and on dead herbaceous stems.
- **benesuada** (Tul.) Phill. 28 (iv, 377); 106 (xxvi, 227); 115 (26); 40 (iv, n.s., 172); 11 (174); *Pseudopeziza*—27 (L, 192); 7 (294); 8 (iv, 203). Exs.: 43 (No. 175, 1881); Cooke, 'Fung. Brit.', Ed. 2, No. 653. On dead branches of alder and willow.
- **Browniana** (Blox.) Boud. 28 (iv, 377); *Pseudopeziza*—8 (iv, 199); *Peziza*—11 (408); 15 (702); Bloxam in 19 (xv, No. 1072, 1865). Nannfeldt in 28 (xx, 198), says that the type specimen is *Heterosphaeria patella* Grev. and that the substratum is not *Epilobium hirsutum* but some Umbelliferous plant, almost certainly *Angelica sylvestris*.
- **caesia** (Fuckel) Sacc. 28 (iv, 377); 115 (26); *Tapesia*—7 (276); 8 (iv, 300*); 40 (iv, n.s., 182); 11 (277); *Peziza*—54 (iii, 746); 13 (317); 15 (693); 18 (369); 20 (ii, 199); 120 (i, 665, 1821). Exs.: 43 (No. 76); Cooke, 'Fung. Brit.', Ed. 1, No. 562; Ed. 2, No. 555. On chips of oak and oak wood.
- **chionea** Mass. & Crossl. 28 (i, 72; iv, 377); 115 (26); 7 (292); 27 (154*, 1896). On decaying stems of *Carex pendula*.
- **cinerascens** Rehm 28 (iv, 377); 115 (26); 7 (290); 35 (227, 1901); Trans. Hull sci.Fld Nat. Cl. (1901, 224*). On dead stem of Umbellifer.
- **cinerea** (Batsch ex Fr.) Karst. 28 (i, 106; iv, 377); Nannfeldt, Inop. Disc. (124†, apothecial structure); Boudier, Icones, pl. 541†; 115 (26); Rev. mycol. (vii, n.s., 67†, pore structure); 71 (xxviii, 133; xxxiv, (13), 6); 70 (xxi, n.s., 401); 27 (L, 192); 102 (iv, 241, morphology and anatomy); 7 (289); 8 (iv, 500); 40 (iv, n.s., 172); 11 (173); *Peziza*—70 (i, n.s., 298); 27 (xvii, 364); 15 (701); 18 (370); 20 (ii, 205); 51 (425); 55 (Appendix iv, 463; 1817, 689); Abbot, Fl. Bedf. (1799, 331); 42 (pl. 64*); 38 (Ed. 3, iv, 355, 1796); Sibthorpe, Fl. Oxon. (794, p. 389); *Octospora*—120 (i, 667). On decaying wood.
- **cinerea** var. **minutella** Sacc. *Mollisia minutella* (Sacc.) Rehm—106 (xxvii, 28, 1940). On dead stems of *Epilobium hirsutum* in damp places.
- **cinerella** Sacc. var. **caespitosa** Phillips in 40 (v, n.s., 89, 1891); 28 (iv, 75; iv, 377). On decorticated wood of beech, Orkneys.
- **conigena** (Pers. ex Fr.) Boud. 28 (iv, 377); 115 (26); Boudier, Icones, pl. 545; *Helotium*—71 (xxviii, 133); 7 (286); 8 (iv, 266); 40 (iv, n.s., 142); 11 (167); 13 (329); 27 (xvii, 364); 15 (710); 18 (372); *Peziza*—20 (ii, 205); 51 (425, 1824). On fallen cones of pine.
- **Curreyana** Phill. 28 (iv, 377); 115 (26); Phillips in 11 (406); *Patellaria palustris* Currey—15 (719); Currey in 45 (xxiv, 155*, 1863); *Peziza palustris*—13 (325); 19 (xv, No. 1080). On dead rushes in water.
- **dactylogluma** Cooke 28 (iv, 377); 115 (26); 7 (292); 8 (iv, 497); Cooke in 14 (xix, 86, 1891). On decaying glumes of *Dactylis glomerata*.
- **discolor** (Mont. & Fr.) Phill. 28 (iv, 377); Rev. mycol. (iv, n.s., 57, synonymy); 115 (26); 71 (xxviii, 133); 40 (iv, n.s., 172); 46 (vi, n.s., 193); 11 (175); *Pseudopeziza*—115 (29); 27 (L, 192); 7 (294); 8 (iv, 203); *Patellaria*—15 (718); 18 (373, 1860); *Hymenoscypha*—Rep. Devon Ass. Adv. Sci. (1932, 133). On dead branches of *Cornus sanguineus*, alder, sycamore, etc.
- **Ebuli** (Fr.) Karst. 28 (iv, 377); 11 (187, 1887); *Pyrenopeziza*—Nannfeldt, Inop. Disc., 148†; *Pseudopeziza*—8 (iv, 202); *Mollisia atrata* var. *Ebuli*—14 (xviii, 82). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 376. On stems of *Epilobium* and *Sambucus Ebulus*.
- **fallax** (Desm.) Gill. 28 (iv, 377); 115 (26); 71 (xxviii, 133); 27 (L, 192); 7 (292); 8 (iv, 217); 11 (175, 1887, see *M. suecica* Starb.). On branches, cones and leaves of pine and larch.
- **fusca** (Schum. ex Fr.) Karst. 28 (iv, 377); 115 (26); 7 (290); 8 (iv, 495); *Lachnella Schumacheri*—71 (xxviii, 133); 40 (iv, n.s., 180); 11 (262); *Peziza Schumacheri*—54 (iii, 746); 27 (xvii, 363); 13 (314); 15 (686); 18 (368); 20 (ii, 196); *Lachnella Schumacheri* var. *plumbea*—11 (262); 13 (314); 15 (688); 65 (xi, 470); *Peziza plumbea*—

- 58 (150); 51 (422); 39 (I, pl. 11, 1823). Exs.: 43 (No. 167). On rotten wood, chips, old trees, branches, etc.
- **Mollisia jugosa** (Phill. & Plowr.) Phill. 28 (iv, 377); 8 (iv, 220); 11 (184); *Peziza*—Phillips & Plowright, in 14 (xiii, 74, 1885). Nannfeldt, 28 (xxiii, 246), found no Discomycete with the type material and suggests that the description may refer to a *Pseudosphaeria*. On dead herbaceous stems.
- **juncina** (Pers. ex Fr.) Rehm 28 (iv, 377); 115 (26); 7 (292); 8 (iv, 214); as *Mollisia melatephra*—40 (iv, n.s., 173); 11 (189); as *Peziza melatephra*—14 (viii, 102); 13 (326, 1879). On dead stems of *Carex* and *Juncus*.
- **lignicola** Phill. 28 (iv, 377); 115 (26); 7 (289); 8 (iv, 206); 27 (L, 192); 71 (xxxiib, 13); 15; 11 (108); Phillips in 14 (xv, 113, 1887). Nannfeldt, 28 (xxiii, 246), regards this as identical with *Mollisia ligni* (Desm.) Karst., which is the legitimate name. On worked wood, decorticated timber, etc.
- **livido-fusca** (Fr.) Gill. 28 (iv, 377); 7 (290); 35 (p. 5, 1904); Halifax Nat. (viii, 90, 1904); *Tapesia*—115 (26); 28 (xii, 293). On decayed decorticated wood.
- **melaleuca** (Fr.) Sacc. 28 (iv, 377); 115 (26); 7 (289); 8 (iv, 500, 1895); 71 (xxviiiB, 133; xxxiib, 13); 15; xLB, 51); by Herb. B.M. as '*Peziza cinerea* Batsch', (with which it has been confounded according to Masee); Cooke, 'Fung. Brit.', No. 390; 43 (No. 125). On hard decorticated wood, chips, etc.
- **palustris** (Rob. & Desm.) Karst. 28 (iv, 377); 115 (26); 46 (vi, n.s., 193); 40 (iv, n.s., 173); 11 (189, 1887); *Pseudopeziza*—8 (iv, 199); 7 (294). Masee regarded *Mollisia Curreyana* q.v. and *Patellaria palustris* as synonyms of the present species. On dead stems and leaves of *Juncus*.
- **Pineti** (Batsch ex Fr.) Phill. 28 (iv, 377); 115 (26); 8 (iv, 216); 40 (iv, n.s., 174); 11 (195); *Peziza*—13 (315); 15 (689); 18 (369); 20 (ii, 197); 38 (Ed. 3, iv, 352, 1796). Also v. Nannfeldt under *Belonidium Jerdoni*. On leaves and cones of *Pinus sylvestris*.
- **Populi** Bayliss Elliott in 28 (vi, 266*, 1920; viii, 7). On dead twigs and branches of poplar, Tanworth-in-Arden.
- **ramealis** Karst. 28 (iii, 379, 1912; iv, 12 & 377). On dead oak branch.
- **suecica** Starb. Bot. Zbl. (1, 1888, 350). The British specimens are represented in the Herb. B.M. by material named *Mollisia fallax* by Phillips and since re-examined and identified as *Durella suecica* (Starb.) Nannf. by Nannfeldt. On fir cones, Haw Wood, June 1881, and another collection by J. Keith at 'Linwilg', both in Herb. Phillips.
- **Typhae** (Cooke) Phill. 28 (iv, 377); 11 (188); *Pseudopeziza*—8 (iv, 190); *Peziza*—Cooke in 14 (I, 131, 1873); 27 (xi, 32). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 570; Ed. 2, No. 388, 43 (No. 127). On leaves of *Typha*.
- **ventosa** Karst. 28 (iv, 377); 115 (26); 108 (viii, Appendix, 113); *Belonidium*—115 (24); 7 (288); 8 (iv, 223); 40 (iv, n.s., 140); 11 (151); *Peziza*—14 (viii, 103); 13 (326, 1879). Exs.: 43 (No. 173). On willow twigs and rotten wood.
- **Mollisiella aggregata** (Felt.) Boud. *Unguiculella aggregata* (Felt.) v. Höhn.—35 (No. 831, 158*, 1949). On dead bark of *Salix*, growing with *Monotospora sphaerocephala* B. & Br., Cottingham, Yorks.
- **albula** (Phill.) Boud. 28 (iv, 377); *Mollisia*—8 (iv, 220); Phillips in 11 (192, 1887); 40 (iv, n.s., 173). On dung of rabbit.
- **epithallina** (Phill. & Plowr.) Boud. 28 (iv, 377); *Mollisia*—11 (173); 8 (iv, 219); *Peziza*—Phillips & Plowright in 14 (vi, 24); *Pezizella*—119 (107); as *Peziza miliaris*—14 (iv, 121, 1876). On thallus of *Peltigera canina*.
- **filicum** (Phill.) Boud. 28 (iv, 377); *Mollisia*—27 (L, 192); 71 (xxviiiB, 133); 8 (iv, 217); 11 (191); *Peziza*—Phillips & Plowright in 14 (xiii, 74, 1885). Nannfeldt, 28 (xxiii, 246), regards this as identical with *Allophylaria chrysostigma* (Fr.) Nannf. *Peziza versicolor* Desm. is the same species, but not Phillips's interpretation of it which equals *Hyaloscypha flaveola* (Cke.) Nannf. 43 (No. 172, 1881). On dead stems of *Nephrodium Filix-mas*.
- **Hypnorum** (Fr.) Boud. 28 (iv, 377); ? *Mollisia*—7 (293); Halifax Nat. (vi, 124, 1902); = ? *Pithyella* q.v. On damp wall among moss and liverworts.
- **Teucrii** (Fuekel) Boud. 28 (iv, 377); Trans. Perthsh. Soc. nat. Sci. (vii, 24); *Mollisia*—8 (iv, 210); 11 (176, 1887). Exs.: 43 (No. 181). On dead stems of *Teucrium scorodonia* in damp places.

- Mollisiella umbonata** (Pers. ex Fr.) Boud. var. **amenticola** (Fuckel) Boud. 28 (iv, 377); 115 (26); *Mollisia amenticola*—28 (ii, 35); 7 (292); 35 (22, 1902). On female catkins of *Alnus glutinosus*.
- Niptera lacustris** Fr. 28 (iv, 377); 115 (26); *Belonidium*—7 (289); 8 (iv, 227); 40 (iv, n.s., 140); 11 (149); *Peziza*—40 (vi, 163); 27 (xvii, 364); 15 (701); 19 (xv, No. 1073); *Patellaria aquatica*—15 (719); 19 (xv, No. 1079); 45 (xxiv, 155*, 1863). On dead rushes and grasses in water.
- **myriadea** (Cooke & Mass.) Boud. *Belonium*—Cooke & Massee in 14 (xxi, 71, 1893). On branches of *Ulex*, Carlisle.
- **pilosa** (Crossl.) Boud. 28 (i, 153; iv, 377); 115 (26); *Belonium*—7 (287); Crossland in 35 (6*, 1900); Halifax Nat. (iv, 114, 1900). On one-year-old stems and leaves of *Carex pendula*, Halifax.
- **pulla** (Phill. & Keith) Boud. 28 (iv, 377); 115 (26); *Belonidium*—7 (289); 8 (iv, 228*); 40 (iv, n.s., 140); 11 (151); 13 (328); Phillips & Keith in 14 (vi, 76*, 1877). On *Phragmites*, *Poa*, *Carex*, *Typha*.
- **punctum** (Rehm) Sacc. 28 (iv, 321, 377); 115 (26); *Belonidium*—35 (175, 1913). On dead leaves of *Nardus stricta*, near Scarborough.
- **Stockii** (Cooke & Phill.) Boud. 28 (iv, 37; xx, 198); *Echinella*—28 (xxiii, 250, is probably a *Pyrenopeziza* sp.); 8 (iv, 307); *Lachnella*—11 (261, 1887). On dead herbaceous stems.
- **Taxi** Rea in 28 (vii, 60, 1921). On bark of *Taxus baccata* in association with *Peniophora laevigata*, at Horsley.
- [**Pezizella Lythri** (Desm.) Shear & Dodge 28 (xxv, 286); 1 (ii, 163, imperfect stage is *Leptothyrium macrothecium* Fuckel); 100 (xiii, 137–170, for life-cycle and American host plants); 27 (1922, 85); *Discohainesia Oenotherae* (Cke. & Ell.) Nannf.—Inop. Disc., 88. ? Perfect stage in Great Britain. On *Rubus fruticosus*, *Cornus* and *Fragaria*.
- Pirottaea Bresadolae** Sacc. var. **Bartsiae** Grove in 27 (Lxviii, 136, 1930). On drying stalks of *Bartsia Odontites*, Stratford-on-Avon.
- **vectis** (B. & Br.) Phill. 28 (iv, 377); 11 (284*); *Echinella*—7 (275); 8 (iv, 304); *Peziza*—36 (xxxv, 92); 15 (692); Berkeley & Broome in 19 (vii, No. 957, 1861); *Pirottaea brevipila* (Rob.) Boud.—This is the legitimate name according to Nannfeldt in 28 (xxiii, 249); Nannfeldt, Inop. Disc. (131, apothecial structure). On dead stems of *Centaurea nigra*.
- **veneta** Sacc. & Speg. 28 (iv, 377); 46 (vi, No. 1395, p. 194, 1890); as *Echinella Senecionis*—8 (iv, 306); as *Pirottaea Senecionis* Cooke & Phill.—14 (ix, 104); Nannfeldt, Inop. Disc. 134, treats these as two distinct species. *P. veneta* differs in its hairs being darker, more numerous and clothing a large part of the excipulum, with *Helleborus* as host; while *P. Senecionis* has *Senecio* as host. It would seem that all British gatherings belong to the latter. On dead herbaceous stems (Massee); ‘not on Hellebore’ (Bucknall).
- [**Pyrenopeziza agrostemmatidis** Fuckel Boudier, Hist. et Class. Disc. d’Europe, 134; *Dyplocarpon agrostemmatidis* (Fuckel) Nannf.—Inop. Disc., 173; 1 (ii, 274, 1937—conidial stage is *Marssonina Delastrei* (Delacr.) P. Magn.). Perfect stage not recorded for Great Britain. On Caryophyllaceae.
- **arenivaga** (Desm.) Boud. 28 (iv, 35, 376); Trans. Butesh. nat. Hist. Soc. (vi, 84); *Pseudopeziza*—8 (iv, 197); *Mollisia arenivaga*—40 (iv, n.s., 173); 11 (186); *Peziza arenivaga*—13 (325); 14 (iv, 122); 43 (No. 84, 1875). On *Psamma arenaria*.
- **arundinacea** (DC.) Boud. 28 (iv, 376); 115 (25); 54 (xv, 205); *Mollisia*—115 (26); 7 (292); 8 (iv, 215); 71 (xxviii, 133); 40 (iv, n.s., 172); 11 (177); 46 (vi, 193); *Eustegia*—13 (350); 14 (iv, 67); 19 (xv, No. 1500, 1875). On dead stems of *Arundo Phragmites*.
- **betulicola** Fuckel 28 (iv, 377); 115 (25); *Mollisia*—7 (291); 35 (7, 1900; 1901, 180); 28 (i, 152); Halifax Nat. (iv, 114, 1900). On decaying birch leaves.
- **Carduorum** Rehm 28 (iv, 376); 115 (25); *Mollisia*—115 (26); 7 (291); 8 (iv, 496); 40 (v, n.s., 89, 1891); 28 (iv, 75). On dead stems of *Cnicus arvensis*, *Carduus lanceolatus*.
- **cyanites** (Phill.) Boud. 28 (iv, 376); 115 (25); *Belonidium*—7 (288); 8 (iv, 225); *Mollisia*—Phillips in 11 (176, 1887); 40 (iv, n.s., 172); Nannfeldt states in 28 (xx, 203), that the host of the type material is *Phragmites communis* and not some ‘herbaceous stem’. Also dead stems of *Epilobium hirsutum*—35 (June 1894).

- Pyrenopeziza digitalina** (Phill.) Sacc. 28 (iv, 376; xxiii, 250); *Mollisia*—8 (iv, 211); 40 (iv, n.s., 173); 11 (190, 1887). Exs.: 43 (No. 128). On dead stems of *Digitalis purpurea*.
- **graminis** (Desm.) Sacc. 28 (iv, 376); 115 (25); Boudier, Icones, pl. 548†; *Pseudopeziza*—7 (294); 8 (iv, 196); *Mollisia*—11 (185, 1887). On dead grasses.
- **grisella** (Cooke & Phill.) Boud. 28 (iv, 377); *Lachnella*—Cooke & Phillips in 11 (260, 1887); *Dasyphypha Carmichaeli*—35 (359, 1898); 8 (iv, 363); 7 (273): According to Nannfeldt in 28 (xx, 204), the type specimen (*Peziza grisea*—Herb. Carmichael) at Kew is identical with *Unguicularia scrupulosa* (Karst.) v. Hoehn. On dead wood.
- **Jasionis** Romell 28 (xi, 6, 1926); *Pseudopeziza Jasionis* (Rom.) Nannf.—Inop. Disc., 180†. On *Jasione montana*, Tintern Foray.
- **Lycopincola** (Rehm) Boud. *Mollisia*—106 (xxvii, 25 & 28, 1940). On dead stems of *Lycopus europaeus*.
- **maculans** (Rehm) Boud. 28 (iv, 376); 35 (146, 1915). On dead leaves of *Nardus stricta*, near Scarborough.
- **Mercurialis** (Fuckel) Boud. 28 (iv, 376); Boudier, Icones, pl. 550†; 115 (25); *Mollisia*—7 (291); 8 (iv, 209); *Peziza*—13 (324); 14 (vi, 24, 1877); *Mollisia atrata* var. *Mercurialis*—11 (183). Exs.: 43 (No. 180). On dead stems of *Mercurialis perennis*.
- **millegrana** Boud. 28 (vi, 330, 1920); Boudier, Icones, pl. 552†; *Mollisia*—Nannfeldt, Inop. Disc., 127†. On dead stems of *Spiraea Ulmaria*, Perth.
- **nervicola** (Desm.) Boud. 28 (iv, 376); 115 (25); *Mollisia*—7 (291); 35 (180, 1901); 28 (i, 196). On veins of decaying oak and sycamore leaves.
- **Plantaginis** Fuckel 28 (iv, 377); Nannfeldt, Inop. Disc., 158†; 54 (xv, 205); *Mollisia*—7 (292); 8 (iv, 213); 46 (vi, n.s., 193); 40 (iv, n.s., 173); 11 (183); *Peziza*—14 (i, 131, 1873). Exs.: 43 (No. 37); Cooke, 'Fung. Brit.', Ed. 1, No. 653; Ed. 2, No. 386. On dead leaves of *Plantago* spp.
- **plicata** Rehm f. **conicola** Bayliss Elliott in 28 (vi, 264, 1920); 1 (i, 75); *Phoma conicola* is the imperfect form—28 (vi, 265). On cones of *Pinus sylvestris*.
- **riccia** (Sacc.) Boud. 28 (iv, 376); 115 (25); *Mollisia discolor* var. *Riccia*—11 (175, 1887); as ? *Pseudopeziza discolor*—8 (iv, 203). On dead wood.
- **Rubi** (Fr.) Rehm 28 (iv, 376); Nannfeldt, Inop. Disc., 159; 115 (25); Boudier, Icones, pl. 547†; *Pseudopeziza*—7 (294); 8 (iv, 198); 35 (1907, 254); *Cenangium*—11 (350); 19 (vii, No. 1924); 13 (336); 15 (725); 18 (374); *Excipula*—20 (ii, 296); 39 (vi, pl. 334*, 1828). Exs.: 43 (No. 43); Cooke, 'Fung. Brit.', Ed. 2, No. 196. On dead raspberry and bramble stems.
- **Tamarisci** (Roum.) Sacc. 28 (iv, 376); *Mollisia*—14 (xv, 113, 1887). On tamarisk.
- **urticicola** (Phill.) Boud. 28 (iv, 377; xxiii, 250); 115 (25); *Mollisia*—7 (291); 8 (iv, 210); 11 (177). Exs.: *Peziza*—Phillips in 43 (No. 177, 1881). On dead stems of *Urtica* in damp places.
- Spilopodia melanogramma** Boud. in 117 (i, 120). The British record is based on material gathered and named *Mollisia atrata* var. *Mercurialis* by D. A. Boyd and since identified as *Spilopodia melanogramma* by J. Nannfeldt. On dead stems of *Mercurialis perennis*, West Kilbride, March 1874.
- **nervisequa** (Pers. ex Fr.) Boud. 28 (iv, 377); Nannfeldt, Inop. Disc., 185†; *Pyrenopeziza*—8 (iv, 213); *Mollisia*—11 (179*); *Peziza*—15 (706); 19 (xviii, No. 1171, 1866). On dead leaves of *Plantago lanceolata*.
- Tapesia Bloxami** (B. & Br.) Sacc. 28 (iv, 377); *Peziza*—14 (iv, 121); 15 (694); 18 (369); Berkeley & Broome in 19 (vii, No. 566, 1851); *Karschia*—8 (iv, 99). On dead wood, fallen branches, etc.
- **evilescens** (Karst.) Sacc. 28 (xix, 284, 1935). On culms of dead grasses, Wicken Fen.
- **fusca** (Pers. ex Fr.) Fuckel 28 (iv, 377; xii, 292, taxonomy; xix, 284); 115 (26); Nannfeldt, Inop. Disc. (163†, structure); 27 (L, 191); 7 (275); 106 (xxvii, 29); 8 (iv, 298); 40 (iv, n.s., 182); 11 (282); *Peziza*—13 (318); 15 (694); 18 (369); 20 (ii, 200, p.p.); 39 (iv, 192, 1825). Exs.: 43 (No. 77); Cooke, 'Fung. Brit.', Ed. 2, No. 556. On wood, fallen branches.
- **Johnstoni** (Berk.) Phill. 28 (iv, 377); 40 (iv, n.s., 182); 11 (282); *Peziza*—36 (xxxi, 515); 13 (318); 15 (695); 18 (369); Berkeley in 19 (xiii, No. 313, 1844). According to Nannfeldt in 28 (xx, 204), the type material is identical with *Cenangella radulicola* (Fuckel) Rehm growing as always on branches of birch infested with *Eutypa atterima*

- (Fr.) v. Hoehn. Berkeley's name antedates Fuckel's. This is not synonymous with *Tapesia fusca* as Massee thought. On fallen branches and decayed sticks.
- Tapesia mutabilis** (B. & Br.) Phill. **28** (iv, 377); **115** (26); **11** (278); *Mollisia*—**7** (292); **8** (iv, 496); *Peziza*—**36** (xxxI, 515*); **15** (694); **18** (369); Berkeley & Broome in **19** (vii, No. 564, 1851). On leaves of *Aira caespitosa*.
- **prunicola** Fuckel **28** (iv, 377); Boudier, *Icones*, pl. 540†; *Tapesia fusca* var. *prunicola*—**115** (26); **8** (iv, 299); *T. Rosae* var. *prunicola*—**11** (279); *Peziza Rosae* var. *prunorum*—**13** (318, 1879). Exs.: **43** (No. 30b). On branches of *Prunus spinosa*.
- **retincola** (Rabenh.) Karst. **28** (iii, 379; iv, 377; xii, 294; xix, 284); Boudier, *Icones*, pl. 538†; **35** (310, 1908; 1909, 179). On dead stems of *Phragmites communis*.
- **Rosae** (Pers. ex Fr.) Fuckel **28** (iv, 377); Nannfeldt, *Inop. Disc.* (164†, structure); **54** (iv, 331); Boudier, *Icones*, pl. 539†; **11** (279); **40** (iv, n.s., 182); *Peziza*—**13** (318); **15** (694); **18** (369); **19** (i, No. 10, 46); **20** (ii, 200, 1836); *Tapesia fusca* var. *rosae*—**7** (276). Exs.: **43** (No. 30); Cooke, 'Fung. Brit.', Ed. 1, No. 477; Berkeley, 'Fung. Brit.', No. 157. On dead branches of *Rosa* and *Rubus*.
- **sanguinea** (Pers. ex Fr.) Fuckel **28** (iv, 377); **7** (276); **8** (iv, 301); **40** (iv, n.s., 35); **11** (281); *Peziza*—**15** (695); **18** (369); **19** (i, No. 11, 1837); *Durella sanguinea* (Pers.) Nannfeldt, *Inop. Disc.*, 293. On dead wood, fir, rose, poplar.

Unclassified

- Hymenoscypha Symphoricarpi** Phill. **28** (iv, 378, unclassified at end of Mollisiaceae); Phillips in **40** (v, n.s., 89, 1891); as *H. aurea*—**40** (1889, 139). On dead branches of *Symphoricarpus racemosus*, Orkney.

PATELLARIACEAE

- Abrothallus microspermus** Tul. **119** (213); *A. Smithii* var. *microspermus*—**68A** (v, 34, 1857). On *Parmelia caperata*.
- **Parmeliarum** (Somm.) Nyl. **28** (iv, 378); **8** (iv, 98*); **117** (xlii, 233, development and biology); Nannfeldt, *Inop. Disc.*, 36, regards this as belonging to his group *Ascoloculares*, not to *Discomycetes*; *Lecidia*—Leighton, *Lichen Fl.* (357; Ed. 3, 386); *Buellia*—A. L. Smith, *Mon. Brit. Lichens* (Ed. 2, Rev. ii, 199); *Lichen parasiticus*—Sm. Engl. Bot. (xxvi, pl. 1866, 1808); *Abrothallus Smithii* Tul. emend.—**68A** (v, 34, 1857; xi, 31); as *Abrothallus Welwitschii* Mont.—**19** (xiii, No. 776, 1854). On various lichens.
- Bactrospora dryina** (Ach. ex Fic. & Schub.) Massal. *Zahlbr.*, *Cat. Lichen. Univers.* (ii, 143, for synonymy); **119** (262); Nannfeldt, *Inop. Disc.*, 319; *Lecidea*—**45** (xxviii, 266*, 1872); *Encycl. Method Bot. Suppl.* (iii, 388, 1813). On bark and oak.
- Biatorella difformis** (Fr.) Wain. **28** (iv, 379); A. L. Smith, *Mon. Brit. Lichens* (Ed. 1, ii, 109); *Lecidea*—**14** (xxii, 59); *L. resinæ* f. *cicatricicola* Leight.—**14** (i, 59, 1872). On bark of firs, in upland districts.
- **fossarum** (Duf.) Rehm **28** (iv, 379); A. L. Smith, *Mon. Brit. Lichens* (Ed. 2, Rev., ii, 115); *Lecidea*—Leighton, *Lichen Fl.* (Ed. 3, 383, 1879); **14** (xxii, 59). On mosses amongst rocks.
- **moriformis** [Ach.] Th. Fr. **28** (iv, 379); A. L. Smith, *Mon. Brit. Lichens* (Ed. 2, ii, 116); *Lecidea tantilla*—Crombie, *Mon. Brit. Lichens*, 76; Leighton, *Lichen Fl.* (354, 1871). On old palings.
- **pinicola** (Massal.) Th. Fr. **28** (iv, 379); **8** (iv, 96, 1895); A. L. Smith, *Mon. Brit. Lichens* (Ed. 2, Rev., ii, 117). On bark of trees, old palings, etc.
- **resinæ** (Fr.) Mudd. **28** (iv, 379); **115** (27); *Trans. Perthsh. Soc. nat. Sci.* (vii, 25); A. L. Smith, *Mon. Brit. Lichens* (Ed. 2, Rev., ii, 117); **7** (305); **8** (iv, 95*); *Peziza*—Mudd., *Mon. Brit. Lichens* (191, 1861); **15** (706); **19** (xviii, No. 1173); *Lecidea*—Crombie, *Lich. Brit.*, 76; **14** (i, 58). Exs.: **43** (No. 39). On resin, bark and wood of fir and spruce.
- Blitrydium calyciiforme** (Rebent. ex Fr.) de Not. **28** (iv, 378); *B. calyciiforme*—**8** (iv, 111*); *Triblidium*—Nannfeldt, *Inop. Disc.* (314, relationships); **13** (345); **15** (757); **18** (380); **19** (xiii, No. 775*); *Phacidium*—**20** (ii, 291, 1836). On lime and oak branches.

- Catinella olivacea** (Batsch ex Fr.) Boud. 28 (iv, 378; vii, 297); Nannfeldt, Inop. Disc. (194, relationships); Boudier, Icones, pl. 452; 106 (xxvi, 221); 115 (27); *Patinella*—7 (305); 8 (iv, 94); *Patellaria*—11 (361); 15 (719); 19 (xv, No. 1077, with fig., 1865); *Rhizina nigro-olivacea*—Currey in 45 (xxiv, 493*, 1864). On rotten wood and willow.
- Discocera lichenicola** A. L. Sm. & Ramsb. in 28 (vi, 48, 1918); *Nesoclechia*—119 (140); Nannfeldt, Inop. Disc., 328. On lichen thalli, on stones, Somerset.
- Durella atro-vinosa** (Blox.) Sacc. 28 (iv, 378); 115 (27); *Patellaria*—7 (305); 8 (iv, 100); 11 (369); 15 (718); 19 (viii, No. 1330*, with fig.; xv, No. 1078); Bloxam MS.; 45 (xxiv, 155*, 1863). On bark.
- **caresciae** (de Not.) Sacc. 71 (xxviii, 134, 1909). On bark, Leinster.
- **compressa** (Pers. ex Fr.) Tul. 28 (iv, 378); Nannfeldt, Inop. Disc., 293; 1 (ii, 145, Imperfect stage is *Cystotricha striola* B. & Br.); 102 (x, 142); 114 (iii, 177†); *Patellaria*—8 (iv, 103); 40 (iv, n.s., 189); 11 (364); *Peziza*—13 (327); 65 (xii, 280); 15 (707); 18 (371); 20 (ii, 207, 1836). On dead wood.
- **connivens** (Fr.) Rehm 28 (iv, 378); Nannfeldt, Inop. Disc., 293; *Patellaria*—8 (iv, 103*); 40 (iv, n.s., 189; v, n.s., 50); 11 (365); 14 (x, 69); *Peziza*—13 (327, 1879). Exs.: 43 (No. 190). On dead wood and dead stems of *Rubus Idaeus*.
- **lecideola** (Fr.) Rehm 28 (iv, 378); Nannfeldt, Inop. Disc., 294†; *Patellaria*—71 (xxviii, 134); 8 (iv, 106); 40 (iv, n.s., 189); 11 (364); 15 (720); *Peziza*—18 (371, 1860). On dead wood of poplar and birch.
- **livida** (B. & Br.) Sacc. 28 (iv, 378); 33 (xlv, 74*); 115 (27); *Pezicula*—28 (xxiii, 242); Nannfeldt, Inop. Disc., 93†; *Dermatea*—33 (xlv, 73–90, study of growth form); 1 (ii, 246, Imperfect stage is *Myxosporium abietinum* Rostr.); 11 (340); 40 (iv, n.s., 187); *Scleroderris*—7 (304); 8 (iv, 127 & 494); 37 (1911, 377); *Patellaria*—33 (xlv, 73); 36 (xxxv, 105); 15 (717); 18 (373); *Peziza*—Berkeley & Broome in 19 (xiii, No. 775, 1854); *Patellaria constipata*—Bloxam MS.; 65 (xii, 282); 15 (720); 14 (i, 132). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 578. On bark of firs and on redwood twigs, and on wood.
- **melanochlora** (Somm.) Rehm 28 (ii, 94; iv, 378); 115 (27); 7 (305); Halifax Nat. (viii, 90, 1904); 35 (6, 1904); Nannfeldt, Inop. Disc., 293. On decorticated alder, Heptonstall.
- **parvula** (Cooke) Sacc. 28 (iv, 378); *Patellaria*—Cooke in 15 (720, 1871); *Patellaria proxima* p.p.—11 (363). On bleached, decorticated wood.
- Heterosphaeria Linariae** (Rabenh.) Rehm 28 (xi, 186, taxonomy); Nannfeldt, Inop. Disc., 297†; 1 (ii, 157, Imperfect stage is *Heteropatella lacera* Fuckel). Imperfect form only. On *Linaria vulgaris*.
- **patella** (Tode ex Fr.) Grev. 28 (iv, 378); Nannfeldt, Inop. Disc., 296; 71 (xxviii, 132; xxxi, 13), 6; 27 (I, 192); 7 (306); 8 (iv, 108*); 11 (371*); 40 (iv, n.s., 190); 1 (ii, 157, Imperfect stage is *Heteropatella Bonordenii* Lind); 115 (27); 13 (344); 15 (754*); Bot. Trans. Yorkshire Nat. Un. (i, 103); 114 (iii, 174); 18 (379); 39 (ii, pl. 103, 1824); *Phacidium*—20 (ii, 291); as *Peziza Chailletii*—15 (702); 18 (371). Exs.: Cooke, 'Fung. Brit.', No. 276; Berkeley Exs., No. 289. On dead herbaceous stems.
- Karskia advenula** (Leight.) Zopf, 28 (iv, 378); 119 (185); *Lecidea*—Leighton in 45 (i, Ser. 2, 146*, 1876); *Buellia*—A. L. Smith, Mon. Brit. Lichens (ii, 184, 1911). On *Pertusaria Wulfenii* var. *repestris*.
- **Bloxami** (Berk. & Phill.) Sacc. 28 (iv, 378); *Patellaria*—Berkeley & Phillips in 11 (361, 1887); 36 (xxxv, 107*). On rotten wood.
- **epiphorbia** (Leight.) Zopf, 28 (iv, 378); *Conida*—28 (xxxi, 308); *Lecidea*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., ii, 111); ? = *Biatorina Wallrothii* (= *Scutula epiblastematica*). On *Solorina bispora*.
- **lignyota** (Fr.) Sacc. 28 (iv, 378); 115 (27); Nannfeldt, Inop. Disc., 323†; 8 (iv, 99); *Patellaria*—40 (iv, n.s., 189); 11 (360); 14 (vi, 25); 15 (720); *Peziza*—18 (371); 19 (viii, No. 579, 1851); ? = *Arthonia melaspermella*—Leighton, Lichen Fl. (Ed. 3, 416). Exs.: 43 (No. 146); Rabenh. Fung. europ. No. 1152. On dead wood.
- **pulverulenta** (Anzi) Koerb. 119 (198); *Abrothallus Smithii* var. *pulverulentus* Linds.—68A (v, 34, 1857). On *Physcia pulverulenta*.
- Lagerheima sphaerospora** (Berk. & Cooke) Sacc. 28 (iv, 378); Trans. Perthsh. Soc. nat. Sci. (vii, 24); 8 (iv, 97*) *Patellaria*—36 (xxxv, 106); 14 (xviii, 85, 1890). Nannfeldt, Inop. Disc., 324, suggests that this belongs to Helotiaceae judging from Massee's description and illustration. On dead wood.

- Lecanidion atratum** (Hedw. ex Fr.) Rabenh. 28 (iv, 378); Boudier, Icones, pl. 564†; 100 (xxxI, 621, ascus dehiscence); *Patellaria*—71 (xxviiiB, 134; xxxiB, (13), 6); Nannfeldt, Inop. Disc., 328†; 8 (iv, 104); 40 (iv, n.s., 189); 11 (366); 65 (xii, 281, taxonomy); 13 (333); 15 (716); 18 (373); 20 (ii, 208); Proc. Belfast Nat. Fld. Cl. (Appendix 1884–5, 310). *Octospora*—120 (667, 1821). Exs.: 43 (No. 90); Cooke, 'Fung. Brit.', Ed. 2, No. 194. On decorticated wood, old sacking, etc.
- **atro-album** (Cooke) Sacc. 28 (iv, 378); 115 (27); *Patellaria*—8 (iv, 105); 11 (369) Cooke in 15 (718, 1871). On decorticated branches.
- **clavisporum** (B. & Br.) Sacc. 28 (iv, 378); 115 (27); *Durella*—115 (27); 8 (iv, 102*); *Patellaria*—7 (370); 36 (xxxv, 106); 11 (366); 15 (717); 18 (373); Berkeley & Broome in 19 (xiii, No. 778, 1854). According to Nannfeldt in 28 (xx, 197), the type collection of this is identical with *Lecanidion Crataegi* (Phill.) Sacc. (v. below) = *Patellaria corticola* Starb. On branches of privet and ash.
- **Crataegi** (Phill.) Sacc. 28 (iv, 378); *Patellaria*—8 (iv, 106); 40 (iv, n.s., 190 & 223); Phillips in 14 (xvii, 46, 1888). Nannfeldt, 28 (xx, 197), states that the type specimen is identical with *Lecanidion clavisporum* (B. & Br.) Sacc. & D. Sacc. v. above. On twigs of hawthorn and blackthorn.
- **Hyperici** (Phill.) Sacc. 28 (iv, 378); *Patellaria*—8 (iv, 107); 11 (363); 14 (x, 69); Phillips in 43 (No. 191, 1881). Nannfeldt, 28 (xx, 197), regards this as *Durella atrocyanea* (Fr.) v. Hoehn. On dead stems of *Hypericum calycinum*, Shrewsbury.
- **Lonicerae** (Phill.) Sacc. 28 (iv, 378); *Durella*—28 (xx, 198); *Patellaria*—28 (iv, 70); 8 (iv, 104*); Phillips in 11 (364, 1887); 40 (iv, n.s., 189). On dead stems of honeysuckle.
- **maurum** (Phill.) Sacc. 28 (iv, 378); 115 (27); *Patellaria*—7 (305); 8 (iv, 101); 11 (368); *Peziza*—Phillips in 14 (iv, 122*, 1876). A note by E. Moldenke referring to the type specimen in Herb. B.M. states 'not Patellariaceae'. On dead wood.
- **minutissimum** (Phill.) Sacc. 28 (iv, 378); *Patellaria*—8 (iv, 106); Phillips in 11 (362, 1887). Nannfeldt, 28 (xxii, 245), writes that no specimen in Phillips's herbarium could be found and that only a water colour drawing exists, and this is identical with *Durella commutata* Fuckel. On decayed wood.
- **proximum** (B. & Br.) Sacc. 28 (iv, 378); 115 (27); *Patellaria*—7 (305); 8 (iv, 101); 11 (363); 36 (xxxI, 468*); 15 (718); Berkeley & Broome in 19 (vii, No. 965, with fig., 1861). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 660. On dead oak.
- **subtectum** (Cooke & Phill.) Sacc. 28 (iv, 378); *Patellaria*—8 (iv, 105); Cooke & Phillips in 11 (365, 1887). On inner bark of *Cistus laurifolius*.
- Leciographa inspersa** (Tul.) Rehm 28 (iv, 378); 119 (226); *Dactylospora*—Mudd, Mon. Brit. Lichens (224*, 1861); as *Leciographa parasitica*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., ii, 201). On *Lecanora parallela* and *Pertusaria communis*.
- **parellaria** (Nyl.) Sacc. & D. Sacc. 28 (iv, 378); *Lecidea*—68A (xi, 38); *Leciographa parasitica* var. *parellaria*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., ii, 201); *Lecidea parellaria*—45 (Ser. 2, i, 238*); 27 (xiv, 362, 1876). On thallus of *Lecanora parallela*, etc.
- **plumbina** Anzi 28 (iv, 378); A. L. Smith, Mon. Brit. Lichens, (ii, 1911, 186); *Mycobacidia flavovirescens*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., ii, 390); *Lahmia*—119 (176). On *Parmelia plumbea*.
- **scapanaria** (Carr.) A. L. Sm. A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., ii, 202); *Lecidea*—Carrington in 65 (vii, 382*, 1863); 119 (249). On hepatics.
- Melaspilea vermifera** Leight. 28 (iv, 378); Leighton in 14 (iii, 114, 1875); 45 (Ser. 2, i, 146*); A. L. Smith, Mon. Brit. Lichens (Ed. 1, ii, 229); *Spilomela*—119 (221); Nannfeldt, Inop. Disc., 332. On *Pertusaria globulifera*.
- Mycobacidea arenicola** (Nyl.) Sacc. & D. Sacc. 28 (iv, 378); *Lecidea*—Leighton, Lich. Fl. (356, 1871). Parasitic on thallus of *Lecanora* sp.
- Nesolechia cetraricola** Arn. 119 (144); *Lecidea*—68A (n.s., ix, 57*, 1869; xi, 31); 45 (xxvii, 364*). On *Cetraria islandica* and *C. juniperina*.
- **Cladoniaria** (Nyl.) Zopf, 28 (iv, 378); 40 (1911, 38); 119 (129); *Lecidea*—45 (xxvii, 364*); A. L. Smith, Mon. Brit. Lichens (ii, 1911, 104); 68A (xi, 307); *Abrothallus*—53 (xxv, 546, 1869). On *Cladonia bellidiflora*, *Cladonia uncialis* var. *turgescens*.
- **leptostigma** (Nyl.) Sacc. & D. Sacc. 28 (iv, 378); *Lecidea*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, ii, 52); 27 (vii, 49, 1869); Leighton, Lich. Fl. (356; Ed. 3, 385); Crombie, Mon. Brit. Lichens, 76. On a mica-schistose boulder, Ben Lawers.

- Nesolechia oxyspora** (Tul.) Massal. 28 (iv, 378); Nannfeldt, Inop. Disc., 328; 119 (123); *Lecidea*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., II, 111); Crombie, Mon. Brit. Lichens, 92; 68A (XI, n.s., 28); Leighton, Lich. Fl., 357; 53 (XXIV, 410*, 1867). ? = *Discocera* A. L. Sm. & Ramsb.—Nannfeldt, Inop. Disc., 328; *Abrothallus*—68A (v, 1857, 37); 36 (IX, 280). Parasitic on various lichens.
- Patellaria Abbotiana** (Sow. ex Fr.) Sacc. 28 (iv, 378): *Peziza*—Sowerby in 42 (pl. 389, fig. 8, 1802); 20 (II, 207). Apparently on wood.
- **fusco-ater** Rehm 40 (iv, n.s., 190, 1889). Trail's fungus is *Corynella atro-virens* (Pers.) Boud. according to Nannfeldt's note in Herb. B.M. On dead wood of *Salix*, Orkney.
- **macrospora** (Fuckel) Phill. 28 (iv, 378); 8 (iv, 102); 11 (367); *Durella* Fuckel—Nannfeldt, Inop. Disc., 293†; as *Peziza nigro-punctula* Gerard—43 (No. 131, 1877). On oak wood.
- Patinella Euphorbiae** (B. & Br.) Sacc. 28 (iv, 378); *Pseudopeziza*—8 (iv, 197); *Mollisia*—11 (198); *Peziza*—Berkeley & Broome in 19 (III, No. 1829, 1879); 14 (VIII, 8). Nannfeldt states in 28 (xx, 201), that the type material in Herb. B.M. is *Naevia tithymalina* (J. Kze.) Rehm. Kunze's epithet antedates 'Euphorbiae' by three years. On stems of *Euphorbia amygdaloides*.
- **macrospora** Mass. 28 (iv, 378); 115 (26); 7 (305); 8 (iv, 93*); 35 (1894, 171); Massee in 14 (XXII, 44, 1893). On rotten wood.
- **rubro-tingens** (B. & Br.) Sacc. 28 (iv, 378); 8 (iv, 92); *Patellaria*—11 (367, 1887—in Herb. Berkeley). On decorticated oak wood, Batheaston.
- Placographia flexella** [Ach.] Th. Fr. 28 (iv, 378); 115 (27); *Patinella*—7 (305); 8 (iv, 93); *Patellaria*—40 (iv, n.s., 189); 11 (362); *Peziza*—13 (327); 15 (707); 18 (371); 20 (II, 207, 1836); *Mycoplacographia*—Nannfeldt, Inop. Disc., 327. On dead wood, pine, etc.
- Pseudophacidium Callunae** Karst. 28 (I, 73; III, 40; iv, 378); Trans. Butesh. nat. Hist. Soc. (vi, 84); 27 (XXXVI, 181, 1898). On dead branches of *Calluna vulgaris*.
- Scutula cristata** (Leight.) Sacc. & D. Sacc. 28 (iv, 379); 119 (163); *Lecidea*—Leighton, Lichen Fl. (Ed. 1, 356, 1876); *Biatorina*—A. L. Smith, Mon. Brit. Lichens (Ed. 1, II, 132; Ed. 2, II, 143 & 389). On *Lecanora subcarnea*.
- **epiblastematica** (Wallr.) Rehm 119 (150); *Biatorina*—A. L. Smith, Mon. Brit. Lichens (Ed. 1, II, 132, 1911; Ed. 2, II, 144 & 389). On thalli of *Peltigera* spp. and on *Solorina saccata*.
- **episema** (Nyl.) Zopf. 119 (160); *Biatorina*—A. L. Smith, Mon. Brit. Lichens (1911, 131). On *Lecanora calcarea*.
- Scutularia citrina** (Chev.) Sacc. 28 (iv, 379 ? = *Apostemidium*; v, 440, 1917); 115 (27); 7 (306); 8 (iv, 100*); *Patellaria*—11 (370); 15 (717); 18 (373); 19 (VII, No. 583, 1851); Glamorgan County History (I, 203). Records made before 1917 are doubtful. On rose twigs in running stream.
- **littoralis** (Phill. & Plowr.) Sacc. 28 (iv, 68 & 378); 8 (iv, 109); *Patellaria*—40 (iv, n.s., 189); 11 (368); *Peziza*—Phillips & Plowright in 14 (iv, 121*, 1876); 13 (324). On sticks, etc.
- **vermifera** (Phill.) Sacc. 28 (iv, 379); 8 (iv, 109); *Patellaria*—1 (II, 151, Imperfect stage is *Excipula ramicola* Gr.); 11 (369, 1887). On dead branches of decorticated holly.
- Tryblidaria melaxantha** (Fr.) Sacc. 28 (iv, 378); *Blitrydium*—8 (iv, 111); *Patellaria melaxantha*—11 (370); *Patellaria melaxantha*—40 (iv, n.s., 189); *Peziza melanotheja*—13 (327); 15 (706); 18 (371); *Peziza melaxantha*—20 (II, 196 & 207, 1836). On wood.

DERMATEACEAE

- Cenangella Ericae** (Niessl.) Rehm 28 (v, 238, 1916); Glasg. Nat., (VIII, 54). On dead leaves of *Calluna vulgaris*, Ayrshire.
- **pinastri** (Tul.) Sacc. 28 (iv, 379); 115 (28); *Tympanis*—7 (304); 28 (iv, 72); 8 (iv, 131); 40 (iv, 79, 1877-8); as *Tympanis larinina*—40 (iv, n.s., 188); 11 (353); as *Cenangium larinina*—13 (336); 14 (II, 187). Exs.: 43 (No. 145). On bark of larch.
- Cenangium Abietis** (Pers.) Duby 28 (iv, 379); 115 (28); 1 (II, 142 & 154); 112 (149); 64 (XL, 120*-5, notes and figures on disease); 71 (XXVIII, 134; XXXIV, (13), 15); 37 (1909, 375); 99 (I, 180*); 23 (1903, 336); 7 (303); 8 (iv, 119); 58 (1831, 147); *Cenangium ferruginosum*—40 (iv, n.s., 187); 11 (346); 13 (336); 15 (725); 114 (1865,

- 168); **18** (374); **19** (vi, No. 161); **20** (ii, 212); **39** (iv, pl. 197*, 1825). One imperfect stage = *Brunchorstia destruens* Erikss., and there is probably also a second pycnidial form; *Dothichiza ferruginosa* Sacc. is a conidial stage—Viennot-Bourgin, Les Champ. parasites, I, 659. Exs.: **43** (No. 44); Cooke, 'Fung. Brit.', Ed. 1, No. 662; Ed. 2, No. 195. Causing a die-back disease of various species of *Pinus*.
- Cenangium aciculum** (Fuckel) Rehm **28** (iv, 379); **8** (iv, 120); **14** (xxi, 72, 1893). On fallen leaves of *Pinus sylvestris*.
- [— **Coryli** Corda **1** (ii, 143, Imperfect stage is *Dothichiza turgida* v. Hoehn.) Perfect form not yet recorded for Great Britain.
- [— **leoninum** Cooke & Mass. **28** (iv, 379); **115** (28); **8** (iv, 118); Cooke & Massee in **14** (xxi, 72, 1893); *Encoelia heteromera* (Mont.) Nannf.—**28** (xxiii, 239, as this is a tropical American species, Nannfeldt suggests that Carlisle is probably not the place of origin as given in the diagnosis). On hard decorticated wood.
- **Prunastri** [Pers.] Fr. **28** (iv, 379); **1** (i, 160, Imperfect stage is *Sphaeronaema spurium* Sacc.); **115** (28); **32** (xii, 207); **40** (iv, n.s., 187); **11** (345); **13** (335); **18** (374); **20** (ii, 211); *Dermatea*—Wormald, Diseases of Fruits and Hops, 1939, 141; **112** (150); **32** (xii, 207); *Phaeangella*—**7** (305); **8** (iv, 137); *Dermatella*—**32** (xii, 207, disease of greengage trees); **104** (ix, 245); *Tympanis*—**32** (xii, 207); *Peziza*—**51** (425); **92** (ii, 33, 1821). Exs.: Berkeley, No. 162. On dead stems of *Prunus* spp., causing die-back.
- **pulveraceum** [Alb. & Schw.] Fr. **28** (iv, 379); **115** (28); **7** (303); **8** (iv, 115); **40** (iv, n.s., 188); **11** (347); **13** (336); **15** (724); **18** (374); **20** (ii, 212, 1821); *Dasyscypha*—Dennis (1949, 57). Exs.: Vize, 'Micro-fungi Brit.', No. 387. On bark of holly, beech, birch, sloe and wood.
- **Sarothamni** Fuckel **28** (iv, 379); Trans. Perthsh. Soc. nat. Sci. (vii, 25); **115** (28); **7** (303); **35** (1901, 178). On dry branches of *Sarothamnus scoparius*.
- **subnitidum** Cooke & Phill. **28** (iv, 379); Trans. Perthsh. Soc. nat. Sci. (vii, 25); **11** (347); **40** (i, n.s., 86; iv, n.s., 187); **14** (iii, 186, 1875); *Phaeangella*—**8** (iv, 137). Exs.: **43** (No. 94). On fallen branches of alder, hazel, *Pyrus Aucuparia*.
- Dermatea Cerasi** (Pers. ex Fr.) de Not. **28** (iv, 379; xi, 5); **115** (27); Nannfeldt, Inop. Disc. (84, apothecial structure); **1** (i, 447, Imperfect stage is *Micropera Drupacearum* Lév.); **114** (156-9†, 1865); **40** (iv, n.s., 187); **11** (341); *Cenangium*—**7** (303); **8** (iv, 117); **13** (335); **27** (xvii, 364); **15** (724); **18** (374); **20** (211); *Peziza*—**51** (426); **55** (Appendix, Vol iii, 264, 1821). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 659. On branches and trunks of cherry, sloe and cherry laurel.
- **Frangulae** (Fr.) Tulasne in **114** (iii, 161); Nannfeldt, Inop. Disc., 84†; **28** (iv, 379); *Scleroderris*—**8** (iv, 122); **1** (i, 161); *Tympanis*—**11** (351); **15** (722, 1871). On branches of *Rhamnus Frangula*.
- **Houghtonii** Phill. **28** (iv, 379); **40** (iv, n.s., 187); **11** (324); Phillips in **14** (vi, 24, 1877); *Scleroderris*—**8** (iv, 124*); *Patellaria*—**40** (iii, n.s., 173). Exs.: **43** (No. 114); Cooke, 'Fung. Brit.', Ed. 2, No. 660. On dead branches of Portugal laurel.
- **nidulariformis** Rea in **28** (v, 188 & 256*, 1916). On dead wood and decorticated branches, Monsal dale, Derbyshire.
- **pseudoplatani** Phill. **28** (iv, 379; xxiii, 242); **115** (27); Phillips in **14** (xvii, 45, 1888); *Scleroderris*—**7** (304); **8** (iv, 125). On bark of *Acer pseudoplatanus*.
- **umbrina** Cooke & Mass. **28** (iv, 379; vi, 64); **70** (xxi, n.s., 401); Cooke & Massee in **14** (xxi, 72, 1893); *Cenangium*—**8** (iv, 118). On dead branches of *Ulex*.
- Encoelia Bloxami** Phill. **28** (iv, 379); Phillips in **14** (xv, 113, 1887); **11** (338); *Cenangium*—**8** (iv, 114); *Diplocarpha Curreyana*—**35** (1901, 181). According to Nannfeldt in **28** (xx, 195), this is *Diplocarpha Curreyana* Massee. See *Dasyscypha diplocarpha* (Curr.) Boud. On dead wood.
- **furfuracea** (Roth. ex Fr.) Karst. **28** (iv, 379); Nannfeldt, Inop. Disc., 304†; **115** (28); **54** (xv, 204); **40** (iv, n.s., 187); **11** (337); *Cenangium*—**7** (303); **8** (iv, 113); *Peziza*—**15** (678); **18** (366); **19** (vi, No. 157*); **20** (ii, 192, 1836). Exs.: **43** (No. 18); Cooke, 'Fung. Brit.', Ed. 1, No. 453. On alder and hazel.
- **populnaea** [Pers.] Schroet. **28** (iv, 379); **115** (28); *Cenangium*—**56** (xliv, 295); **7** (303); **8** (iv, 114); *Encoelia fascicularis* (Fr.) Karst.—Nannfeldt, Inop. Disc., 304†; **40** (iv, n.s., 187); **11** (336*); *Peziza fascicularis*—**15** (678); **18** (366); **20** (ii, 191); *E. fascicularis* var. *repagulis*—**11** (337); *Peziza crispa*—**55** (ii, 692, fig. 7); **42** (pl. 425, figs. 1 & 2, 1814). Exs.: Berkeley, No. 154; Cooke, 'Fung. Brit.', Ed. 1, No. 478; **43** (No. 17). On dead branches of *Fraxinus*, *Salix*, *Populus*, *Quercus*, etc.

- Encoelia tiliacea** (Fr.) Karst. 28 (iv, 317, 1914; iv, 379); 46 (vii, 4th. ser., 109); Trans. Perthsh. Soc. nat. Sci. (vii, 26). On dead lime branch, Perthshire.
- Godronia callunigena** Karst. 28 (iv, 379); 37 (375, 1909); *Crumenula*—8 (iv, 133, 'doubtful species'); 11 (356); *Peziza*—14 (xiii, 74, 1885). v. note under *G. Ericae*. On dead branches of *Calluna vulgaris*.
- **Ericae** (Fr.) Rehm 28 (iv, 379); *Crumenula*—8 (iv, 132*); 11 (357); *Cenangium*—14 (vi, 24, 1877); Nannfeldt, Inop. Disc., 287, states that *Crumenula Ericae* Phill. and *G. Ericae* Rehm = *Scleroderris callunigena* (Karst.) Nannf. Exs.: 43 (194). On dead branches of *Calluna vulgaris*.
- **Ledi** (Alb. & Schw. ex Fr.) Karst. 28 (iv, 380); *Crumenula*—8 (iv, 134, 'doubtful species'); 40 (iv, n.s., 188); 11 (357); *Peziza*—13 (318); 15 (696); 18 (370); 19 (vi, No. 160, 1841). On *Arctostaphylos Uva-ursi*.
- **urceoliformis** Karst. 28 (iv, 379); 8 (iv, 133); *Crumenula*—40 (iv, n.s., 188); 11 (356*); *Cenangium*—14 (xiii, 75, 1885). On dead stems of *Vaccinium Vitis Idaea* and *V. uliginosum*.
- Laquearia sphaeralis** Fr. 28 (iv, 379); 8 (iv, 68*); 11 (372*); 15 (721); 18 (373); 20 (ii, 213, 1836, Purton MSS.). On dead decorticated branches of ash.
- Pezicula amaena** Tul. 28 (iv, 379); 114 (iii, 184†); *Cenangium*—8 (iv, 116); *Dermatea*—14 (xvi, 94, 1888). Imperfect stage is *Cryptosporiopsis amaena* (v. Hoehn.) Petrak. On dead oak branches, autumn.
- **cinnamomea** (Pers. ex Fr.) Sacc. 28 (iv, 379); *Scleroderris*—8 (iv, 126); *Dermatea*—11 (342*); 19 (vii, No. 1923, 1881); 14 (x, 51); 100 (xxxiii, 515, discussion on taxonomy). Saccardo in Syll. Fung., viii, 311, regards this and *P. cinnamomea* DC. as synonyms, and Phillips's specimen, 11 (342), as identical. Rehm, Rab. Krypt. Fl. 1, 3, 252, treats Phillips's specimen as *Dermatea Alni*. On maple bark.
- [— **corticola** Nannf. 1 (ii, 253, Imperfect stage is *Myxosporium corticola* Edg.). Only imperfect stage recorded for Great Britain.
- **dryina** (Cooke) Sacc. 28 (iv, 379; xxiii, 247); 115 (27); 106 (xxvi, 227); *Cenangium*—7 (303); 8 (iv, 117); *Dermatea*—11 (340, 1887, Cooke in litt.); 14 (vii, 62, 1878, name only). On oak bark and wood.
- **eucrita** Karst. 28 (iv, 198, 1913; iv, 379; vi, 353); Boudier, Icones, pl. 559†. On bark of *Pinus sylvestris*, Cheshire and Warwickshire.
- **Fagi** (Phill.) Boud. 28 (iv, 379); *Scleroderris*—7 (304); 8 (iv, 127); *Dermatea*—40 (iii, n.s., 173; iv, n.s., 187); Phillips in 14 (xv, 114, 1887); *P. rhabarbarina* (Berk.) Tul. var. *Fagi* (Phill.)—115 (27); *Pezicula carpinea*—106 (xxii, 319); Nannfeldt in 28 (xxiii, 248), considers that this may be identical with *Pezicula carpinea* (Pers. ex Fr.) Tul. On *Fagus sylvaticus*.
- **nectrioides** (Phill.) Sacc. 28 (iv, 379); *Cenangium*—8 (iv, 119); *Dermatea*—27 (xxiv, 134); Phillips in 11 (340, 1887). On cones of *Pinus sylvestris*.
- **quercina** Fuckel 108 (ix, 49, 1934); Rev. mycol. (iv, n.s., 63, = *Dermatea cinnamomea* (Pers.) see Rehm). On *Cornus alba*.
- **rhabarbarina** (Berk.) Tul. 28 (iv, 379; xxiii, 248, valid name is *P. rubi* (Lib.) Niessl., according to Nannfeldt); 106 (xxvii, 29); 115 (27); Boudier, Icones, pl. 560†; *Dermatea*—1 (ii, 255, Imperfect stage is *Myxosporium phaeosorum* All.); 40 (iv, n.s., 187); 11 (343); *Patellaria*—15 (717); 27 (xvii, 364); 13 (333); 18 (373); *Peziza*—19 (i, No. 89); Berkeley in 20 (ii, 197, 1836); *Scleroderris Rubi*—7 (304); 8 (iv, 123). Exs.: 43 (No. 91); Cooke, 'Fung. Brit.', Ed. 2, No. 656. On dead branches of bramble and rose.
- Phaeangella Empetri** (Phill.) Boud. 28 (iv, 74 & 379); 115 (28); 35 (1913, 251); *Cenangium*—28 (iv, 74); Phillips in 40 (v, n.s., 89, 1891); *Phaeangella Smithiana*—35 (1912, 206); *Pseudophacidium Smithianum*—Boudier in 28 (iii, 81*; iii, 324, transfers to *Phaeangella*); Glasg. Nat. (i, 3 & 112). On *Empetrum nigrum* leaves, Yorkshire and Scotland.
- **Ulicis** (Cooke) Sacc. 28 (iv, 379; xxiii, 249, 'this is an *Encoelia*'); 8 (iv, 137); *Dermatea*—11 (339); Cooke in 14 (iii, 186, 1875). On dead twigs of *Ulex*.
- Phaeangium phaeosporum** (Cooke) Boud. 28 (iv, 379); *Schweinitzia*—8 (iv, 135); *Cenangium*—11 (346); Cooke in 14 (xii, 44, 1883). According to Nannfeldt in 28 (xx, 202), the type in Herb. Kew is very poor and appears to be *Velutaria rufolivacea* (Alb. & Schw. ex Fr.) Fuckel. On sycamore bark.

- Pocillum Boltonii** Phill. 28 (iv, 380); 115 (28); 8 (iv, 231); Phillips in 14 (xvi, 94, 1888). On dead *Equisetum* stems, in water.
- **Cesatii** (Mont.) de Not. 28 (iv, 380); 8 (iv, 230, 1895). On the under-surface of dead oak leaves, Epping Forest.
- **Needhami** Mass. & Crossl. 28 (iv, 380); 115 (28); 7A (1909 Ed., 287); 7 (287); 8 (iv, 498, 1895). On fallen decaying leaves of *Salix caprea* probably, also oak.
- Scleroderis amphibola** (Massal.) Gill. 28 (iv, 379); 8 (iv, 126); *Tympanis*—40 (iii, n.s., 173; iv, n.s., 188); 11 (352); *Peziza*—14 (i, 132, 1873); *Phragmopora*—Nannfeldt, Inop. Disc., 331. On bark of *Pinus sylvestris*.
- **bacillifera** (Karst.) Sacc. 28 (ii, 136 & 139, 1907; iv, 12 & 379); Trans. Perthsh. Soc. nat. Sci. (vi, 26). On dead branches of *Abies excelsa*.
- **fuliginosa** (Pers. ex Fr.) Karst. 28 (iv, 379; xi, 161); 93 (225); 1 (ii, 152, *Topospora proboscoides* Fr. as Imperfect stage); 100 (xxv, 55); 64 (xxix, 34); 8 (iv, 124); *Cenangium*—114 (iii, 166*); 40 (iv, n.s., 188); 11 (348); 13 (336); 27 (xvii, 364); 15 (724); 18 (374); 20 (212, 1836). On branches of willow.
- **majuscula** Cooke & Mass. 28 (iv, 379); 8 (iv, 125); Cooke & Massee in 14 (xxi, 73, 1893). Nannfeldt in 28 (xx, 204) states that the type material at Kew is *Coryne sarcoides* (Jacq. ex Fr.) Chev. On oak bark.
- **ribesia** [Pers.] Karst. 28 (iv, 379); 1 (i, 343, Imperfect stage is *Fuckelia Ribis* Bon.); 115 (28); Boudier, Icones, pl. 563†; 7 (304); 8 (iv, 121*); *Cenangium Ribis*—11 (349); 15 (723); 18 (374); 19 (vii, No. 585, 1851). Exs.: Vize, 'Micro-fungi Brit.', No. 485. On currant twigs.
- **seriata** (Fr.) Rehm 28 (iv, 379); 8 (iv, 121); 100 (xxv, 56); *Cenangium*—11 (348); 14 (xv, 114, 1887); *Dermatea*—114 (iii, 160). On branches of *Betula alba*.
- [**Trochila Buxi** Capron 28 (iv, 380); 115 (28); 71 (xxviii, 132); 8 (iv, 61); 40 (iv, n.s., 221); 11 (397); 13 (350); 15 (768, 1871, Capron in litt.); *Phacidium*—1 (i, 125); *Laestadia*—71 (xlb, 6); according to Nannfeldt, 28 (xx, 205), the type at Kew and two other British specimens (Forden, leg. Vize; Bungay, leg. Stock), are *Hyponectria Buxi* (D.C.) Sacc., full account of latter in 102 (xxi, 303); as *T. craterium*—18 (381). On dead box leaves.
- **craterium** Fr. 28 (iv, 380); 1 (i, 289); Nannfeldt, Inop. Disc. (197, regards this as *Dermateaceae* sensu Nannf.); 27 (i, 193); 71 (xxviii, 132); 115 (28); 7 (308); 8 (iv, 61*); Glasg. Nat. (ii, 140); 40 (iv, n.s., 221); 11 (396*); 13 (350); 15 (768); 114 (iii, 180); Proc. Belfast Nat. Fld Cl. (Appendix 1884-5, 312); *Sphaeria*—20 (ii, 277); *Cryptosphaeria punctiformis* var. *Hederae*—51 (362, 1824); *Astoma hederae*—120 (525); *Sphaeria Hederae*—42 (pl. 371, fig. 5, 1802); Imperfect stage—*Gloeosporium paradoxum*, also ? *Ceuthospora Hederae*—1 (i, 289). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 180; Ed. 2, No. 294. On dead ivy leaves.
- **Laurocerasi** (Desm.) Fr. 28 (iv, 380); 93 (197); 34 (xxiii, 700); 71 (xxviii, 132); 115 (28); 27 (lxxi, 288); 8 (iv, 61); 40 (iv, n.s., 221); 11 (397); 70 (i, n.s., 299); Proc. Belfast Nat. Fld Cl. (Appendix 1884-5, 312); 15 (767); 18 (381); *Phacidium*—20 (ii, 293, 1836); *Pyrenopeziza*—Nannfeldt, Inop. Disc., 153; Imperfect stages *Ceuthospora Laurocerasi* Gr. and *Gloeosporium phacidium* Gr. 1 (i, 291; ii, 220); 34 (xxiii, 700, demonstrating connexion between pycnidial and perfect stages). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 179; Ed. 2, No. 295; Berkeley Exs., No. 45. On leaves of *Prunus Laurocerasus*.
- **Laurocerasi** var. **smaragdina** Lévl. 28 (iii, 124, 1909; iv, 380). On dead leaves of cherry laurel, Lincolnshire.
- [— **salicis** Tul. 28 (iii, 119; iv, 36, 380); 114 (iii, 181); 1 (ii, 225); Imperfect stage is *Gloeosporium Salicis* Westd. Perfect stage not yet found in Great Britain.
- **Tini** (Duby) Quel. 27 (lxxi, 287, 1933; lxxix, 173, effect on host); *Pyrenopeziza Tini* (Duby) Nannf. Inop. Disc., 162. On underside of fallen leaves of *Viburnum Tinus*, Hadzer Hall, Worcs.
- Tympanis Alnae** [Pers.] Fr. 28 (iv, 379); 8 (iv, 130); 40 (iv, n.s., 188); 11 (355); 13 (335); 15 (722); 18 (374); 20 (ii, 210, 1836). On alder.
- **conspersa** Fr. 28 (iv, 379); 115 (28); 7 (303); 8 (iv, 128*); 40 (iv, n.s., 188); 11 (354*); 13 (335); 15 (723); 18 (374); 20 (ii, 211); 39 (vi, 338); as *Tympanis Aucupariae*—40 (iv, n.s., 188); 11 (354); as *Cenangium Aucupariae*—13 (335); 15 (724); 18 (374); 20 (ii, 212); as *Peziza Aucupariae*—51 (426, 1824); as *Tympanis conspersa* var.

mali—8 (iv, 129). On dead branches of rowan, apple, hawthorn and other Rosaceae, also birch and poplar.

Gympanis Fraxini Fr. 28 (iv, 379); 8 (iv, 130); 40 (iv, n.s., 188); 11 (355); 13 (335); 15 (722); 18 (374); 20 (ii, 210, 1836). On branches of ash.

Ligustri Tul. 28 (iv, 379); 114 (154); 8 (iv, 131); 11 (353); 15 (723); as *T. saligna*—18 (374); 19 (vii₂, No. 584, 1851). On twigs of *Ligustrum vulgare*.

Velutaria fraxinicola (B. & Br.) Boud. 28 (iv, 379); *Lachnella*—11 (275); *Peziza*—15 (678); Berkeley & Broome in 19 (xviii₃, No. 1160, with fig., 1866); *Schweinitzia rufo-olivacea*—7 (304); 8 (iv, 135); Nannfeldt, 28 (xxiii, 252), says that the valid name is *Velutaria rufo-olivacea* (Alb. & Schw. ex Fr.) Fuckel. On ash twigs, elder, privet.

rufo-olivacea (Alb. & Schw. ex Fr.) Fuckel 28 (iv, 379); 115 (27); Boudier, Icones, pl. 558†; *Lachnella*—40 (iv, n.s., 181); 11 (275*); *Schweinitzia*—7 (304 = '*P. fraxinella* B. & Br.');

8 (iv, 135); *Peziza*—54 (iii, 746); 13 (314); 15 (688); 19 (vii₄, No. 1320, with fig.); 18 (368); 20 (ii, 197, 1836); v. *Velutaria fraxinicola* (B. & Br.) Boud. On dead bramble and ash.

STICTIDACEAE

Briardia purpurascens Rehm British record based on a specimen in Herb. B.M. and identified by J. Nannfeldt as *Dubenia purpurascens* (Rehm) Nannf. For the synonymy v. Svensk bot. Tidskr. (xxiii, 319). On bean stalks, Tetsworth, Oxon, Feb. 1844.

Cryptodiscus angulosus Karst. 28 (iv, 380); 115 (28); 7 (307); 8 (iv, 87); *Propolis*—11 (378, 1887). On branches of *Salix*, and on dead wood.

microstomus (Carm.) Sacc. 28 (iv, 380); 8 (iv, 87*); *Stictis*—40 (iv, n.s., 190); 11 (383); 13 (340); 15 (734); 18 (375); *Stictis microstoma*—20 (ii, 213, 1836). On wood.

pallidus (Pers. ex Fr.) Corda 28 (iv, 380); 115 (28); Boudier, Icones, pl. 569†; 7 (307); 8 (iv, 86); *Stictis*—40 (iv, n.s., 190); 11 (382*); 13 (340); 15 (734); 18 (375); 20 (ii, 213, 1836). On decorticated wood, beech wood.

Lasiostrictis conigena Sacc. & Berl. 28 (iv, 380); 115 (29, no locality given).

Melittosporium lichenicolum (Mont.) Sacc. 28 (iv, 380); 71 (xxviii₁, 132); 119 (260, a lichen identical with *Urceolaria scruposa* β *parasitica*); 8 (iv, 88*); *Stictis*—11 (382); 15 (735); 14 (iv, 123); 18 (375); 19 (vi, No. 166, 1841). Parasitic on lichens, *Cladonia*, *Caenomyces*, etc.

pteridinum (Phill. & Buckn.) Sacc. 28 (iv, 380); 8 (iv, 88*); *Stictis*—11 (384); 14 (xiii, 75); Phillips & Bucknall in 46 (iv, n.s., 58*, 1883). On stems of *Pteris aquilina*.

Naevia seriata (Lib.) Fuckel 28 (iv, 380); *Phacidium*—8 (iv, 59); *Stictis*—40 (iv, n.s., 190); 11 (385); 13 (341); 14 (iv, 123, 1876). Exs.: 43 (No. 100). On dry leaves of *Carex* spp.

Nemacyclus niveus (Pers. ex Fr.) Sacc. 28 (iv, 380); 115 (29); 7 (306); 8 (iv, 80*); Glasg. Nat. (i, 140); *Schmitzomyia*—11 (381); *Stictis*—15 (735); 18 (375); 19 (vi, No. 167, 1841). Exs.: 43 (No. 149); Cooke, 'Fung. Brit.', Ed. 2, No. 661. On fallen leaves of various conifers.

Ocellaria aurea Tul. 28 (iv, 380; x, 132); 8 (iv, 82*); *Propolis Lecanora*—40 (iv, n.s., 190); 11 (374); *Stictis Lecanora*—13 (340); 15 (735); 19 (xviii₃, No. 1172, 1866); *Ocellaria ocellata*—1 (ii, 256, Imperfect stage is *Myxosporium scutellatum* Hoehn). On dead willow and poplar twigs.

chrysophaea (Pers. ex Fr.) Qué. 28 (iv, 380); 8 (iv, 84); *Propolis*—40 (iv, n.s., 190); 11 (377); *Stictis*—13 (340); 15 (735); 19 (vii₃, No. 966, 1861, with fig.; vii₄, No. 1328*). On wych elm and decorticated oak branches.

Masseana Sacc. & Syd. 28 (iv, 380); as *O. succinea*—Massee in 8 (iv, 83, 1895). On beech bark.

punctiformis (Pers. ex Phill.) Sacc. 28 (iv, 380); 7 (306); 8 (iv, 84); *Stictis*—11 (386, 1887); 54 (iv, 731). On dead wood and willow.

Odontotrema longius Nyl. 28 (iv, 380); Leighton, Lich. Fl. (358, 1871). On old rails. For lichenicolous spp. of this genus v. 28 (xxxi, 315).

Phormonaevia hysteroideus (Desm.) Rehm 28 (iv, 380); 8 (iv, 85*); *Stictis*—11 (384); 15 (735); 18 (375); 19 (xiii, No. 314, 1844); *Hysteropezizella*—Nannfeldt, Inop. Disc., 118. On dead leaves of *Carices*.

- Propolis faginea** [Schräd.] Karst. 28 (iv, 380; xi, 5); 115 (28); 71 (xxviiiB, 132; xxxixB, 13), 14; 7 (306); 8 (iv, 81*); *Propolis versicolor* Fr.—11 (376*); *Stictis versicolor*—13 (341); 15 (736); 18 (375); *Cryptomyces versicolor*—20 (ii, 214, 1836). Exs.: Cooke, 'Fung. Brit.', Ed. 2, No. 463. On pales, chips and cones.
- **rhodoleuca** (Somm.) Fr. 28 (iv, 380); 1 (ii, 133, Imperfect stage = ? *Pseudopatellina conigena* Hoehn.); 115 (28); 7 (306); 8 (iv, 81); 11 (375, 1887); *P. rhodoleuca* var. *strobilina*—11 (375). On cones of *Pinus sylvestris*.
- **Rosae** Fuckel 28 (iv, 380); 40 (v, n.s., 35); 11 (377, 1887); as *P. faginea* p.p.—8 (iv, 81). On fallen branches of *Rosa canina*.
- Schizoxylon Berkeleyanum** (Dur. & Lév.) Fuckel 28 (iv, 380); Nannfeldt, Inop. Disc., 80; Boudier, Icones, pl. 568†; 115 (29); 7 (309); 8 (iv, 69*); *Schmitzomia*—11 (379); *Stictis*—14 (vi, 25, 1877). On dead stems of *Epilobium hirsutum* and *Artemisia vulgaris*.
- **sepicolum** Pers. ex Dur. & Mont. 28 (iv, 380); 8 (iv, 69, 1895); 114 (iii, 148). On old weathered wood, oak, pine, etc.
- Stictis annulata** Cooke & Phillips in 14 (ix, 8, 1880); 28 (iv, 380); 115 (29); 7 (306); 8 (iv, 79); *Schmitzomia*—11 (379). On dead branches of honeysuckle.
- **arundinacea** Pers. ex Fr. 28 (iv, 380); 8 (iv, 78); *Schmitzomia*—11 (380); *Stegia*—65 (xii, 285); ? *Stictis gramineum*—11 (386); 19 (vii₄, No. 1328, 1871). On various grasses and sedges.
- **atro-alba** (Phill. & Plowr.) Sacc. 28 (iv, 380); 8 (iv, 79); *Schmitzomia*—Phillips & Plowright in 11 (379*, 1887). On branches of *Clematis*.
- **fagicola** Phillips in 11 (385, 1887). On fallen dead decorticated branches of beech.
- **fimbriata** Schwein. 28 (iii, 48 & 114, 1909). On pine cones, Beaufort Woods, Inverness-shire.
- **Luzulae** Lib. var. **Junci** Karst. 28 (iv, 380); *Schmitzomia Junci*—40 (iv, n.s., 190 & 223, 1889); *Schmitzomia Luzulae* var. *Junci*—14 (xviii, 85); *Stictis arundinacea* var. *Junci*—8 (iv, 78). On culms of *Juncus* spp.
- **radiata** [Linn.] Pers. ex Fr. 28 (iv, 380); 115 (29); 108 (viii, Appendix, 114); 71 (xxviiiB, 132); 27 (I, 192); 7 (306); 8 (iv, 77*); 13 (340); 27 (xvii, 364); 15 (734); 18 (375); 20 (ii, 213); 39 (iv, pl. 227); *Schmitzomia*—40 (iv, n.s., 190); 11 (380); *Peziza marginata*—38 (Ed. 2, iii, 440, 1792); 42 (pl. 16). On decayed wood, twigs, etc.
- **stellata** Wallr. 28 (I, 73; iv, 380); Trans. Butesh. nat. Hist. Soc. (vi, 84); 27 (xxxvi, 182, 1898). On dead stems of *Eupatorium cannabinum*.
- **sulfurea** Rehm 28 (ii, 93, 1905; iv, 380). On decaying oak branch, Bushey Park.
- Xylogramma longum** (Pers. ex Fr.) Rehm Boudier, Hist. et Class. Disc. d'Europe, 172; *Stictis*—15 (736); 13 (341); 18 (375); 20 (ii, 213, 1836); 11 (386, 'is a *Xylographa*' and treated as rejected species). On wood, Scotland.
- Xylographa laricola** Nyl. 28 (iv, 380); A. L. Smith, Mon. Brit. Lichens (Ed. 2, ii, 246); 14 (iii, 128, 1875); Leighton, Lichen Fl. (Ed. 3, 391). On bark of old larch, Ben Lawers, Perthshire.
- **parallela** [Ach.] Fr. 28 (iv, 380); 8 (iv, 64*); Leighton, Lichen Fl., 362; *Stictis*—13 (340); 15 (736); 18 (375); 20 (ii, 213); *Hysterium abietinum*—Loud., Hort. Brit. (455, 1830). On dead wood.
- **scaphoidea** Stirt. 28 (iv, 380); Stirt. in 14 (iii, 35); as *X. parallela* Fr. var. *pollens* Nyl.—A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., ii, 246); 14 (I, 173); Leighton, Lichen Fl. (Ed. 3, 391). On fir palings.
- **spilomatica** (Anzi) Th. Fr. 28 (iv, 380); A. L. Smith, Mon. Brit. Lichens (Ed. 2, ii, 224). On a decorticated fir tree.

PHACIDIACEAE

- Celidium endocarpicola** (Lindsay) Boud. *Lecidea*—Lindsay in 53 (xxv, 547*, 1869); *Mycobilimbia*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, ii, 389); 119 (171). On *Endocarpus* sp.
- **varians** (Dav.) Arn. 28 (iv, 381); 8 (iv, 110*); Arnold in Flora (xlv, 312); *Lichen varians* Davies in 45 (ii, 284, 1794); *Arthonia varians*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, Rev., ii, 240); 68A (xi, 38). Parasitic on *Lecanora glaucoma*.

- Laccomyces Boydii** A. L. Sm. 28 (iv, 381); A. L. Smith in 28 (iii, 39, 1908); Glasg. Nat. (i, 112; vii, 8). On dead branches of *Myrica Gale*.
- Clematidis** (Phill.) Sacc. 28 (iv, 381); *Phacidium*—8 (iv, 60); Phillips in 14 (xvii, 46, 1888). On dead branches of *Clematis*.
- coronatus** (Schum. ex Fr.) de Not. 28 (iv, 381); Nannfeldt, Inop. Disc., 226†; 115 (29); 7 (307); 8 (iv, 51); 1 (ii, 167, Imperfect stage is *Leptothyrium botryoides* Sacc.; ii, 171, ? Imperfect stage is *Leptothyrium discosioides* Keissl.; ii, 177, ? Imperfect stage is *Schizothyrella quercina* Thüm.); 71 (xxviii, 132; xxxiv, (13), 14); *Phacidium*—40 (iv, n.s., 221); 70 (i, n.s., 298); 11 (394); 114 (iii, 134); 45 (xxiv, 155*); 15 (752); 18 (379); Proc. Belfast Nat. Fld Cl. (Appendix 1884-5, 311); Ann. Mag. nat. Hist. (1840, 5); 19 (i, No. 58*, with fig.); 20 (ii, 292); 58 (133); 39 (i, 52); *Peziza comitalis*—42 (pl. 118); *Peziza viridis*—38 (Ed. 2, iii, 444); 111 (pl. 109, fig. 1, 1789). Exs.: 43 (No. 201); Cooke, 'Fung. Brit.', No. 457. On dead oak and beech leaves.
- dentatus** (Kunze & Schm.) Sacc. 28 (iv, 381); 115 (29); 1 (ii, 165, Imperfect stage is *Leptothyrium quercinum* Sacc.); 7 (307); 8 (iv, 52); *Phacidium*—40 (iv, n.s., 221); 11 (393); 13 (343); 15 (752); 114 (iii, 132); 18 (379); 20 (ii, 292); 51 (366, 1824). On fallen oak and sweet chestnut leaves.
- Pini** (Alb. & Schw. ex Fr.) Karst. 28 (iv, 381); *Coccophacidium*—8 (iv, 53*); *Phacidium*—40 (iv, n.s., 221); 11 (392); 13 (342); 15 (751); 45 (xxiv, 155*); 18 (379); 20 (ii, 292, 1836); 114 (iii, 136). On bark of *Pinus sylvestris*.
- quadratus** (Kunze & Schm.) Karst. 28 (iv, 381); Glasg. Nat. (i, 112); 8 (iv, 54); *Phacidium leptideum* Fr.—40 (iv, n.s., 221); 11 (395); 13 (344); 14 (viii, 9); 19 (iii, No. 1830, 1879). On dead stems of *Vaccinium Myrtillus*.
- Rubi** (Fr.) Karst. 28 (iv, 381); 1 (ii, 174, Imperfect stage is *Leptothyrium Rubi* Sacc.); 8 (iv, 53); *Phacidium*—11 (394); 15 (754); 18 (379); 19 (vii, No. 586, 1851); Broome's specimen in Herb. B.M. is wrongly determined according to J. Nannfeldt. On dead *Rubus* stems, Twycross, Warwickshire.
- Colpoma quercinum** (Pers. ex Fr.) Wallr. 28 (iv, 381; xxix, 234*); Nannfeldt, Inop. Disc., 227†; 115 (30); 7 (308); 8 (iv, 62*); Glasg. Nat. (i, 142); 15 (765); 27 (xvii, 364); *Cenangium*—18 (374); 20 (ii, 212); *Sphaeria collapsa*—42 (pl. 373, fig. 3, 1802). On twigs of oak.
- Cryptomyces maximus** (Fr.) Rehm 28 (iv, 380; xi, 161); Nannfeldt, Inop. Disc. (206†, structure and affinity); 115 (29); 112 (153); 71 (xlb, 51); *Rhytisma*—20 (ii, 290); 114 (iii, 122); 13 (344); 15 (755); 18 (379); *Cryptomyces aureus*—7 (309); 8 (iv, 74*); *Sphaeria aurea*—42 (pl. 356, 1801); *Cryptomyces Wauchii*—39 (iv, pl. 206). Exs.: Cooke, 'Fung. Brit.', No. 670. Canker of willow.
- Fabraea maculata** Atk. 93 (119, Perfect stage not yet found in Great Britain); 77 (for year 1925, 80); 79 (v, 30; xi, 53); 1 (ii, 191, Imperfect stage is *Entomosporium maculatum* Lév.); 71 (xlb, 51); 112 (148); 85 (xxvii, 87; xxxix, 18); Viennot-Bourgin, Les Champ. parasites, i, 676†. On quince and pear, leaves and fruit.
- Rousseanana** Sacc. & Bomm. 70 (xxi, n.s., 401, 1936). On *Caltha palustris*, Knocksedan, Dublin.
- Keithia tetraspora** (Phill.) Sacc. 28 (iv, 70 & 380; xxiii, 245); 64 (li, 46); 8 (iv, 49*); Nannfeldt, Inop. Disc. (73, difficult to place); *Phacidium*—40 (vi, 164; iv, n.s., 220); 11 (388); 102 (xv, 337); 27 (xviii, 346); Phillips & Keith in 31 (xiv, 308* 1880). On upper surface of leaves of juniper.
- thujina** Durand 93 (239); 112 (154); 71 (xlb, 51); 65 (xxxv, 106); 64 (xliii, 48; li, 46; xlii, 77, etc.); 56 (li, p. xxxiii); 79 (vii, 25); 28 (vi, 366; xiv, 181); 85 (xxiv, 149); 94 (xiii, 93, 1919, outbreak in Ireland; xiii, 287, records in Sussex; xv, 73); Scot. For. J. (xlii, 77); ? *K. thuyae*—76 (i, 22). On *Thuja* spp.
- Tsugae** Farlow 64 (xlii, 77, 1928; li, 46). On *Tsuga* sp.
- Massea quisquilarum** (Berk & Cooke) Sacc. 28 (iv, 381); 8 (iv, 403); 14 (xxi, 71); *Peziza*—41 (pl. 10, fig. 37); Berkeley and Cooke in 36 (x, 366, Cuban fungi). On vegetable debris on damp ground.
- Neofabraea perennans** (Zeller & Childs) Kienh. Imperfect stage, *Gloeosporium perennans* Zeller & Childs, only so far recorded in Great Britain, 28 (xxviii, 77*); 31 (cxiv, 159). Causing a die-back of branches and rot of apples.
- Patellaea pallida** (Berk.) Mass. 28 (iv, 381); 7 (305); 8 (iv, 97*); *Patellaria*—11 (362); Berkeley in 19 (iii, No. 1831, 1879). On thorn-wood and alder root.
- Phacidium abietinum** Kze. & Schm. 28 (iv, 380); 115 (29); 7 (308); 8 (iv, 57); 40

- (iv, n.s., 221); **11** (392); **13** (343); **15** (752, 1871); **19** (vii, No. 1330, 1871). On fallen leaves of pine and larch.
- Phacidium Calthae** Phill. **28** (iv, 380); **40** (iv, n.s., 220); **11** (391); **14** (viii, 103); Phillips in **13** (344, 1879); *Pseudopeziza*—**8** (iv, 192); *Fabraea*—**28** (xxiii, 248). On decaying leaves of *Caltha palustris*.
- [— **carbonaceum** Fr. **11** (396, 'rejected species'); **15** (751); **18** (379); **20** (ii, 292, 1836); *Discinella*—**19** (v, No. 426). On willow twigs.
- **discolor** Mout. & Sacc. in Saccardo, Syll. Fung. (viii, 716); *Phacidiella* **23** (xix, 263, in Germany); Z. PflKrankh. (xxii, 129, 1912, detailed study); Rep. Agric. Hort. Res. Stat. Bristol ('1926', 139, 1927); **112** (152); **28** (xiii, 78, 1928); **93** (137); **1** (i, 343; ii, 358); Wormald, Diseases of Fruits and Hops (1939, 84, 123); Nannfeldt, Inop. Disc. (212, regards the genus *Phacidiella* as belonging to Myriangiales). Imperfect stage is *Phacidiophycnis Malorum* Poteb. = *Fuckelia conspicua* Marchel. *Ocellaria pyri*—**8** (iv, 83); *Propolis pyri*—**71** (375); *Stictis lecanora* var. *pyri*—**19** (xvii, No. 1624* with fig., 1876); die-back and bark canker of apples and pears.
- [— **Falconeri** Henn. **1** (i, 292, Imperfect stage is *Ceuthospora Rhododendri* Gr.). Imperfect stage only in Great Britain.
- [— **gracile** Niessl. **1** (i, 290, Imperfect stage is *Ceuthospora Lycopodii* Lind.). On dead leaves of *Lycopodium clavatum*, Ness, Wirral, Cheshire.
- **humigenum** Cooke & Mass. **28** (iv, 380); Cooke & Massee in **14** (xvi, 78, 1888); *Phacidium terrestre* var. *humigenum*—**8** (iv, 58). According to Nannfeldt in **28** (xxiii, 248), this is synonymous with *Podophacidium xanthomela* (Pers. ex Fr.) Schroet. On damp decaying twigs and leaves on the ground.
- **infestans** Karst. **28** (iv, 380); **115** (29); **7** (308); **8** (iv, 57*, 1895). On leaves of *Pinus sylvestris*.
- **minutissimum** Auersw. **28** (iv, 70 & 380); **115** (29); **102** (xv, 301, critical notes); **8** (iv, 59); **40** (vi, 164; iv, n.s., 220); **11** (389); **15** (752, 1871); *Naevia minutissimum* (Auersw.) Rehm—Nannfeldt, Inop. Disc., 189†. On dry oak leaves.
- **multivalve** (DC ex Fr.) Kunze & Schm. **28** (iv, 380); **1** (i, 289, Imperfect form is *Ceuthospora phacidioides* Grev.); **71** (xxviii, 132; xxxiv, (13), 14); **115** (29); **27** (i, 193); Proc. Hampshire Fld Cl. (1910, 339); **7** (307); **8** (iv, 56); *Phacidiostroma*—Nannfeldt, Inop. Disc., 244; *Phacidium Illicis* Lib.—**114** (iii, 138, with figs.); **11** (390); **40** (iv, n.s., 220); Proc. Belfast Nat. Fld Cl. (Appendix 1884–5, 111); **15** (753); *Sphaeria bifrons*—**42** (pl. 316, 1801); *Phacidium Aquifolii*—**65** (xii, 283). On dead holly leaves.
- **simulatum** Berk. & Cooke **28** (iv, 380); **11** (390); **15** (754); Berkeley & Cooke in **19** (vii, No. 967, with fig., 1861); *Pseudopeziza*—**8** (iv, 198); *Pyrenopeziza*—**28** (xxiii, 249). On dead stems of *Clinopodium simulatum*.
- **striatum** Phill. & Plowr. **28** (iv, 380); **115** (29*); **11** (392*); Phillips & Plowright in **14** (xiii, 75, 1885); *Coccomyces*—**7** (307); **8** (iv, 51*). On dead stems of *Rubus*.
- **Vaccinii** Fr. **28** (iv, 380); **1** (i, 292, Imperfect stage is *Ceuthospora latitans* Grove); **115** (29); Trans. Perthsh. Soc. nat. Sci. (vii, 26); **27** (xlvii, 349); **7** (308); **8** (iv, 57); **40** (iv, n.s., 220); **11** (389); **13** (342); **15** (751); **18** (379); **20** (ii, 292); *Phacidium*—**58** (134, 1831); as *Phacidium Arctostaphyli* Karst.—**40** (iv, n.s., 221); **11** (391); *Phacidium phacidioides* Mass.—**8** (iv, 58); *Stictis phacidioides* Fr.—**13** (341); **15** (736); **18** (375); **19** (vi, No. 162); *Sphaeria Arbuti*—**42** (pl. 370, fig. 6, 1802). On leaves of *Vaccinium Vitis Idaea* and *Arctostaphylos uva-ursi*.
- Pseudographis elatina** (Ach.) Nyl. **28** (iv, 381); **8** (iv, 65); *Lecanora*—Leighton, Brit. Lichen Fl. (21, 1871; Ed. 3, 223); **27** (viii, 98, 1870); Crombie, Mon. Brit. Lichens (i, 455); *Haematomma*—A. L. Smith, Mon. Brit. Lichens (Ed. 2, i, 355). On bark of holly.
- **pinicola** (Rebent. ex Fr.) Rehm **28** (iv, 381); **8** (iv, 65*, 1895); *Tryblidium*—**14** (iv, pl. 67, fig. 8†); *Phacidium fibrosum*—**65** (xii, 283, 1875). On bark of *Pinus sylvestris*.
- Pseudopeziza Alismatis** (Phill. & Trail) Sacc. **28** (iv, 380); Glasg. Nat. (i, 112); **8** (iv, 194); *Mollisia*—Phillips & Trail in **14** (xvi, 93, 1888); **40** (iv, n.s., 174); *Pyrenopeziza*—**28** (xxiii, 250). On fading leaves of *Alisma plantago*.
- **Artemisiae** (Lasch) Mass. **28** (iv, 381); **8** (iv, 195); *Mollisia*—**11** (188); *Peziza*—**14** (i, 131, 1873). On dead stems of *Artemisia vulgaris*.

- Pseudopeziza Cerastiorum** (Wallr.) Fuckel 28 (III, 48; IV, 380); 54 (XV, 205); 70 (XXI, n.s., 401); Glasg. Nat. (I, 33); 56 (XXVI, 655); 8 (IV, 192); *Mollisia*—40 (IV, n.s., 174); 11 (199*); *Fabraea*—1 (I, 373, Imperfect stage is *Septoria Cerastii* R. & D.); *Peziza*—14 (III, 66, 1874). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 655. On leaves and stems of *Cerastium* and *Stellaria*.
- foecunda** (Phill.) Mass. 28 (IV, 68 & 381); 115 (29); 8 (IV, 200); *Mollisia*—40 (IV, n.s., 173); 11 (189); *Peziza*—14 (VIII, 102); 13 (326, 1879, Phillips in litt.); *Hysteropezizella*—28 (XX, 203; *Hysteropezizella subsessilis* (Rehm) Nannf. and *Mollisia scirpina* Peck are synonyms). Exs.: 43 (No. 184, 1881). On dead stems of *Eleocharis*.
- Medicaginis** (Lib.) Sacc. 28 (IV, 380); 93 (26); 1 (I, 29, Imperfect stage is *Phyllosticta Medicaginis* Sacc.; II, 227, Imperfect stage probably *Gloeosporium Trifolii* Peck); 112 (148); Nannfeldt, Inop. Disc., 178; 70 (XXI, n.s., 401); 79 (I, 29; V, 29); 71 (XLIB, 51); 8 (IV, 193, 1895); *Pyrenopeziza*—110 (XIII, 307–30†, in America, morphology and physiology). On leaves of various spp. of *Medicago*, Lucerne and Alfalfa.
- petiolaris** (Alb. & Schw. ex Fr.) Mass. 28 (IV, 381); 115 (29); 71 (XXXIB, 13); 15; 7 (294); 8 (IV, 195); *Mollisia*—Glasg. Nat. (I, 112); *Mollisia erumpens*—40 (IV, n.s., 174); 11 (197); *Peziza erumpens* Grev.—13 (323); 15 (704); 18 (371); 39 (pl. 99, 1824); 20 (II, 206); *Pyrenopeziza*—Nannf. Inop. Disc., 158. Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 566. Ed. 2, No. 384; 43 (No. 35). On fallen petioles of sycamore and horse chestnut.
- radians** (Rob. & Desm.) Karst. 28 (IV, 380); Nannfeldt, Inop. Disc., 179; 8 (IV, 193); *Phacidium*—11 (388); 14 (II, 165, 1874). On leaves of *Campanula* spp.
- Ranunculi** (Wallr.) Fuckel 28 (IV, 380); 115 (29); 71 (XXVIII, 134); 7 (293); 8 (IV, 191); *Mollisia*—40 (IV, n.s., 174); 11 (200); *Dothidea*—20 (II, 287, 1836); *Fabraea*—71 (XLIB, 51); 70 (XXI, n.s., 401); 28 (XVII, 13); *Phacidium*—13 (343); 15 (753). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 280; Ed. 2, No. 452; Berkeley Exs., No. 347. On fading leaves of *Ranunculus repens*.
- repanda** (Fr.) Karst. 28 (IV, 380); Nannfeldt, Inop. Disc., 179†; 1 (I, 241, ? Imperfect stage is *Placosphaeria punctiformis* Sacc.); 115 (29); Glasg. Nat. (II, 94); 7 (293); 8 (IV, 933); *Phacidium*—40 (IV, n.s., 221); 27 (XVII, 364); 11 (395); 13 (343); 15 (753); 18 (379); 20 (II, 293); 58 (134, 1831). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 283. On stems and leaves of various plants, especially *Galium*, *Sherardia*, *Asperula*, etc.
- Ribis** Kleb. 28 (XIII, 311, 1928); 93 (163, 165); Wormald, Diseases of Fruits and Hops (1939, 173, 187); 77 (1928/9, 128); 79 (I, 8; VII, 18; XI, 51); 1 (II, 224, Imperfect stage is *Gloeosporium Ribis* (Lib.) Mont. & Desm.); 77 (1928–30, II Suppl., 128–9); 78 (105, 1925; 1928, 109; 1929, 166); 99 (XXVI, 115); 65 (XXX, 340); 56 (XXXIII, p. clxv, record of Imperfect stage); 71 (XLB, 51); 23 (XIV, 357, ? Imperfect stage; XXXVI, 594; XXXVII, 255); 112 (148); *Drepanopeziza Ribis* (Kleb.) v. Hoehn.—Nannfeldt, Inop. Disc., 170. Currant and gooseberry leaf-spot disease.
- sphaeroides** [Pers.?] Fuckel var. **Lychnidis** Phill. 28 (IV, 381, the authorities quoted are given by Boudier, Hist. et Class. Disc. d'Europe, 180 but Persoon's *sphaeroides* is probably *Tympanis conspersa*); Trans. Perthsh. Soc. nat. Sci. (VII, 27); *Pseudopeziza sphaeroides*—115 (29); 35 (1907, 254); 7 (294); 8 (IV, 200); *Mollisia sphaeroides*—40 (IV, n.s., 173); 11 (187); *Peziza sphaeroides*—13 (322); 15 (702); 18 (371); 19 (VII, No. 577, 1851); *Pseudopeziza Lychnidis*—108 (VIII, Appendix, 113); *Pyrenopeziza Lychnidis*—Nannfeldt, Inop. Disc., 154†. Exs.: 43 (No. 34); Cooke, 'Fung. Brit.', No. 577. On dead stems of *Lychnis* spp.
- Trifolii** (Biv-Bern.) Fuckel 28 (IV, 380); 79 (I, 29; XI, 44, etc.) 93 (30); 112 (148); 71 (XXVIII, 134; XLB, 51); Nannfeldt, Inop. Disc., 178; 70 (XXI, n.s., 401); 13 (1916, 5); 53 (LVI, 507*); 115 (29); 74 (IX, 65, description and hosts); 65 (XXX, 322); 23 (XXI, 381; XXXIV, 144); 89 (1906, 246*); 105 (LXII, 54, critical notes); 7 (293); 8 (IV, 190); *Mollisia*—40 (IV, 174); 11 (99); *Phacidium*—13 (343); 15 (753); *Ascobolus*—27 (II, 154); 18 (374); 20 (209, 1836). Exs.: Berkeley, No. 69; Cooke, 'Fung. Brit.', Ed. 1, No. 331; Ed. 2, No. 451. On clover leaves.
- Rhabdocline Pseudotugae** Syd. 93 (238); 34 (XVII, 745*); 28 (XIII, 146; XIV, 183); 64 (XL, 37, 1926, introduced into Scotland before 1914 but no serious effects noticed until 1922); 65 (XXIX, 342; XXX, 338); Nannfeldt, Inop. Disc., 1932, p. 213, regards *Rhabdocline* as related to *Keithia* and not belonging to Phacidaceae. Causing leaf-fall in Douglas fir.
- Rhytisma acerinum** [Pers.] Fr. 28 (IV, 381; IX, 183); 93 (218); 1 (II, 186, *Melasmia* stage); 112 (154); 102 (III, 138; XV, 317); 115 (30); 33 (XXXVII, 731; XXXIX, 41

- life-history and development); **70** (I, n.s., 298; **xxi**, n.s., 401); **71** (**xxviii**, 132; **xxxiv**, (13), 14); Proc. Hampshire Fld Cl. (1910, 339); **27** (**xvii**, 364; **L**, 193); **89** (201*); **56** (**xxvii**, 938; **xxix**, 363*); **23** (**vii**, 6; **xiv**, 106); **8** (**iv**, 70); **37** (1901, 87*); **46** (**ii**, pt. 1, 216); **13** (345); **15** (756); **114** (116†); **18** (379); **58** (1831, 135); **20** (**ii**, 290); *Xyloma*—**51** (367); **39** (**ii**, pl. 118); **92** (**ii**, 9); *Mucor granulosus*—**38** (Ed. 3, **iv**, 403, 1796). Imperfect stage is *Melasmia acerina* Lév. Müller in Zbl. Bakt. (Abt. 2, **xxxvi**, 67) separates *R. acerinum* into biological forms. On sycamore and maple leaves.
- Rhytisma Andromedae** [Pers.] Fr. **28** (**iv**, 381); Nannfeldt, Inop. Disc., 249†; **115** (30); **48** (**xvi**, 206); **35** (1894, 266); **71** (**xxviii**, 132); **8** (**iv**, 72); **15** (755); **18** (379); **20** (**ii**, 290, 1836). On upper surface of living leaves of *Andromeda polifolia*.
- **Empetri** White **28** (**iv**, 381); **13** (345); **40** (**iii**, 273; **v**, 234); White in **19** (**xvii**, 4, No. 1630, 1876); *Melasmia*—**1** (**ii**, 187). According to Nannfeldt in **28** (**xxiii**, 251), this is not a Discomycete but a conidial stage of unknown relationship identical with *Melasmia Empetri* Magn. On *Empetrum nigrum*.
- **Pseudoplatani** Müller **28** (**ix**, 183, 1924); **93** (218). On *Acer pseudoplatanus*.
- **punctatum** [Pers.] Fr. **28** (**iv**, 381); **115** (30); Nannfeldt, Inop. Disc., 247; **27** (**L**, 193); **23** (**xiv**, 106); **89** (1906, 202*); **8** (**iv**, 71*); **56** (**xxix**, 364*); **13** (345); **15** (756); **18** (379); **20** (**ii**, 291); *Sphaeria subconfluens*—**55** (**iii**, 284); **42** (pl. 370, fig. 7?, 1802). On sycamore leaves.
- **salicinum** [Pers.] Fr. **28** (**iv**, 381); **40** (1911, 38); Nannfeldt, Inop. Disc., 248; **1** (**ii**, 188, Imperfect stage is *Melasmia salicina* Lév.); **71** (**xxviii**, 132; **xxxiv**, (13), 6); **70** (**xxi**, n.s., 401); **115** (30); **27** (**L**, 27, reference to a fossil in lake dwelling at Glastonbury); **89** (1906, 222*); **8** (**iv**, 71); **56** (**xxix**, 384); **13** (344); **15** (755*); **18** (379); **20** (**ii**, 290); **58** (1831, 134); *Xyloma*—**39** (**ii**, pl. 118); **55** (**iii**, 318, 1821); **92** (**ii**, 9, 1821). On leaves of *Salix* spp.
- **symmetricum** J. Müller **28** (**xxix**, 149); **93** (223); **22** (**Lxx**, 65, 1929). On leaves of *Salix*.
- **Urticae** Fr. **28** (**iv**, 381); **115** (30); **8** (**iv**, 73, 'doubtful species') **13** (345); **15** (756); **18** (379); **20** (**ii**, 291, 1836). On dead stems of nettle.
- Schizothyrium aquilinum** (Schum.) Rehm **28** (**iv**, 381); **115** (29); **7** (307); **8** (**iv**, 55, 1895). On dead fronds and rachis of bracken.
- **Parmicae** Desm. **28** (**iv**, 381); **115** (29); **1** (**ii**, 168, Imperfect stage is *Leptothyrium Parmicae* Sacc.); **71** (**xxviii**, 132); **56** (**xxvii**, 375); **7** (307); **8** (**iv**, 55); *Labrella*—**19** (**xvii**, 4, No. 1629*); **35** (n.s., 1, 60, 1875); also **19** (1, No. 107, with fig., 1838, on plant originally brought from Lille); **40** (**iii**, 178, 317). On living leaves of *Achillea Parmicae*.
- Sphaeropezia Empetri** Fuckel **28** (**iv**, 381); Nannfeldt, Inop. Disc. (214†, uncertain position).
- Sporomega degenerans** (Fr.) Cooke **28** (**iv**, 381); Nannfeldt, Inop. Disc., 250†; *Colpoma*—**8** (**iv**, 63*, 1895). On dead branches of *Vaccinium*.
- Stegia Ilicis** Fr. **28** (**iv**, 381); Boudier, Icones, pl. 570†; **115** (29); **71** (**xxviii**, 132); **8** (**iv**, 62*); **40** (**iv**, n.s., 222); **11** (398*); **70** (1, n.s., 298); Proc. Belfast Nat. Fld Cl. (Appendix 1884–5, 312); **27** (**xvii**, 364); **15** (767); *Trochilia*—**71** (**xxxiv**, (13), 6); **27** (**L**, 193); **102** (**xv**, 331); **7** (308); *Eustegia*—**20** (**ii**, 280); *Xyloma concava*—**51** (368); *Sphaeria concava*—**42** (pl. 317, 1801). Exs.: Cooke, 'Fung. Brit.', Ed. 1, No. 178; Ed. 2, No. 293. On fallen holly leaves.

INOPERCULEAE IMMARGINATAE

Ascocorticium anomalum (Ellis & Harkness) Schroet. **28** (**vii**, 60, 1921). On bark of *Pinus sylvestris*, Weybridge.

Unclassified

(The following genera were not included in Boudier's classification of Discomycetes.)

Myriangium Duriaei Mont. & Berk. **71** (**xxviii**, 135); **100** (**xxx**, 160, development and classification); **28** (**vii**, 1 & 33; **x**, 45; **xxix**, 74); **21** (**iv**, 74, 1845); Leighton, Lichen Fl. (1872, 37); Nannfeldt, Inop. Disc. (27 & 33, classed among his Ascoloculares). On *Chionaspis salicis* on ash, other records on ash or elm.

- Omygena corvina** Alb. & Schw. ex Fr. 71 (xlb, 6, 1931); 28 (v, 10); 37 (1911, 377); = *O. apus* B. & Br. in 19 (vii, No. 582, 1851); 15 (642). On skeleton of unknown bird, on bones.
- **equina** Willd. ex Fr. 66 (cxix, 269*, 1899, life-history); 28 (i, 31, nutrition); 71 (xxviii, 134); 7 (241); 37 (1911, 377); 15 (641); 39 (vi, pl. 343); Ann. Mag. nat. Hist. (v, 1840, 5); *Lycoperdon gossipinum*—111 (pl. 178, 1791); Ray, Syn. (Ed. 3, t. 1, f. 3, 1724); *Lycoperdon equinum*—42 (pl. 292, 1800). On decaying horn, old sock, horses' hooves.
- **piligena** Fr. 28 (iv, 22); 7 (241); *O. 'pilifera'* Fr.—28 (i, 61). On owl pellets, rotting cloth, etc.
- Ostropa cinerea** Fr. Rabenh. Krypt. Fl. i, 3, 188†; Sacc. Syll., (ii, 804); 8 (iv, 66). In Herb. C. E. Broome on ash and on cabbage stalks. On dry branches of ash, poplar, willow, hazel, etc.
- Robergea unica** Desm. Rabenh. Krypt. Fl., i, 3, 190; Sacc. Syll., (ii, 806); 8 (iv, 67); 28 (xxiv, 142); *Valsa lageniformis* (Sollm.) Currey, 45 (xxiv, 157*, 1863); 19 (xv, 1865, No. 1096); 15 (ii, 829). On branches of ash, poplar, etc.
- Sphaerosoma ostiolatum** Tul. Fungi Hypog., 184†; Ramsbottom, Handbk., 197; 8 (iv, 400); 15 (746); 18 (378); Ann. Mag. nat. Hist. (xviii, 79, 1846); 33 (xxiii, 262, transferred from Tuberaceae to Discomycetes). Treated as a Discomycete by Ramsbottom, Rehm, Massee, Saccardo, and as one of the Tuberales by Cooke, Tulasne, etc. For recent theories v. Gäumann, Die Pilze, 1949 and Malençon in Rev. mycol., iii, n.s., mem. No. 1. Under leaves amongst loose mould.

Fossil fungi

- Rhytisma Eucalypti** Ett. & Gard. 67 (xxx, 231, 1880, fossil fungus). Alum Bay, Isle of Wight.
- **priscum** Ett. & Gard. 67 (xxx, 231, 1880, fossil fungus). Alum Bay, Isle of Wight.

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INDEX TO GENERA AND SPECIES

[Synonyms and names not accepted are in italics. Imperfect stages are indexed at the end.]

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REVIEWS

A Monograph of Clavaria and Allied Genera. By E. J. H. CORNER. Annals of Botany Memoirs, No. 1. Oxford University Press (London: Geoffrey Cumberlege). 1950. pp. xv + 740, 16 coloured plates, 298 text-figures. Price £5. 5s. od.

The most urgent need in systematic mycology at the present time is for good monographs, of genera and of the larger groups, to provide material for the revised classification of the fungi which must eventually emerge. This need is as great for the larger and relatively better known Basidiomycetes as it is for lower fungi, since modern microscopic methods have revealed the importance of characters which were unknown to the early mycologists. It was welcome news that Mr Corner was preparing a monograph of the Clavarias of the world and their allies, and now that the book has appeared it will be eagerly studied by all who are interested in the Basidiomycetes. Mr Corner is especially qualified to write such a monograph. Having already a good knowledge of European forms before he went to Malaya, he was there able to study the tropical species in the fresh state and to make comparisons. The volume is a record of work which was begun in 1925 and continued at intervals since, much of it having been written during the author's enforced detention in Singapore during the Japanese occupation.

Mr Corner has applied to the Clavarioid fungi the methods of hyphal analysis which he elaborated in earlier papers dealing with certain tropical Polypores. On the basis of hyphal construction he separates *Pterula* and its allies as the 'Pteruloid series' in which the structure is dimitic. The trimitic state does not occur in these fungi; the remaining genera are all monomitic, but these are divided into four groups according to the presence or absence of inflation in the hyphae, of clamp connexions, and the existence of dichophyses. In the further subdivision into genera much importance is attributed to the occurrence of secondary septation in hyphae and basidia and to the location of pigment. Since the author considers that the clavarioid fruit body is not, in itself, an indication of affinity he does not define any systematic unit higher than the genus. Groups of genera thought to be allied are put together as *series*. It is difficult to understand, however, why *Thelephora* in the strict sense (= *Phylacteria* Pat.) should be included. Although this genus is not here dealt with in detail, it is mentioned several times as being one of the Clavarioid fungi. In this Mr Corner has followed Maxwell S. Doty, but one cannot help wondering whether both have been confused by Patouillard's erroneous use of the name *Thelephora* for the fungi which he later called *Podoscypha*, that is, the stipitate hyaline-spored species which were at one time included in *Thelephora*. Even Donk, whom otherwise Mr Corner has followed fairly closely, did not attempt to link *Thelephora* and its resupinate ally *Tomentella* with any of the Clavarias.

The first 31 pages of the book give a good general account of these fungi, dealing with structure, development and mode of branching, together with notes on the development of the hymenium, geographical distribution, affinities, and collection and study. The following 140 pages are occupied with detailed taxonomic and morphological notes on the various genera recognized, with discussions as to affinities based on the hyphal characters which the author considers important, and sometimes with attempts to construct phylogenetic 'trees'. To the practical mycologist such speculations about descent in fungi seem to belong to the realm of imagination, and are out of place in a book said to be intended for laboratory and field use. If these somewhat academic discussions had been relegated to separate papers both size and price might have been reduced and the book thus made more accessible for students.

The systematic part of the work begins at p. 172 with a suggested 'natural classification', followed by artificial keys to the genera of clavarioid fungi with white and with coloured spores. The student wishing only to name his species will probably turn first to these artificial keys. Each genus is then described in detail and keys to the species provided. Twenty-seven genera are distinguished, of which nine are new. Of the 540 species enumerated the author has himself collected some 120, and he has examined type or authentic

material of some sixty more. The remainder he has fitted into his classification as far as possible from the published descriptions. British mycologists may find it difficult to recognize their well-known species under unfamiliar names. *Clavaria* is typified by *C. ermicularis* Fr. and restricted to simple forms of similar structure, that is, with thin-walled inflating hyphae without clamps, but sometimes secondarily septate. Other simple forms are to be found in such genera as *Clavulinopsis* van Overeem, defined as including white-pored *Clavarias* also with inflating thin-walled hyphae, but with clamps and without secondary septation. Odd simple species occur in other genera. The branched forms are distributed chiefly between *Ramaria* S. F. Gray emend. Donk (for those with coloured pores), *Ramariopsis* Donk, and *Clavulina* Schroet. (the *C. cristata* group). *Clavaria gigaspora* Cotton is identified with *Merisma tuberosum* Grev. and referred to a new genus *Aphelaria*, consisting chiefly of tropical species of rather tough texture, with thick-walled hyphae and no clamps.

Whether all of these genera will stand the test of use remains to be seen. The differences between some of them seem hardly sufficient for generic distinction and such points as the presence of clamps may be so difficult to ascertain as to leave the student in doubt whether he has missed them.

Some nomenclatural points should be mentioned. In discussing the definition and typification of *Ramaria* S. F. Gray emend. Donk (see p. 124) Mr Corner rightly approves the selection as type of one of the species enumerated by Holmskjöld, the pre-Friesian author who first used the name *Ramaria*. He does not, however, apply the same principle to the selection of a type specimen for species, since he follows Donk in calling our common, green-staining branched *Clavaria* of pine woods *Ramaria ochraceo-virens* (Jungh.) Donk instead of *R. abietina* (Pers.) Quél. Fries took up the name *Clavaria abietina* Pers. in Syst. Myc. I (the starting-point for the nomenclature of the group), but unfortunately identified it with a common Swedish species which does not turn green (= *C. Invalii* Cotton & Wakef.). Persoon's greening species he thought to be a variety only. Persoon's specimen of *C. abietina* exists at Leiden, and the reviewer is strongly of opinion that this should be the type specimen for *C. abietina* Pers. ex Fr., and not Fries's misidentification. Corner also follows Donk in referring *Clavaria Broomei* Cotton & Wakef. as a synonym of '*Ramaria nigrescens* (Brinkm.) Donk'. It will be noted that no reference is given for '*Clavaria nigrescens* Brinkm.'. As far as can be ascertained this name was never published, and exists only as a manuscript name on a specimen in Bresadola's herbarium. It has therefore no nomenclatural status.

Misprints are very few. The citation of fig. 95 at the bottom of p. 39 is obviously a mistake for fig. 91, and on p. 91 '*Lachnocladium zonale*' should be *L. zonatum*.

As might be expected, the study of tropical forms has revealed the existence of many undescribed species. Forty-five new species are described, and numerous new varieties, but unfortunately the type specimens are not indicated, nor their whereabouts.

Understanding of the arguments as to structure is facilitated by very fine black-and-white illustrations. There are also sixteen plates in colour to show habit, but some of these figures must have suffered in reproduction. On pl. 8, for instance *Clavulinopsis luteo-alba* appears to be almost exactly the same in colour as *C. pulchra*, whereas in reality it is very different and of a more apricot tinge.

A list of species and synonyms is provided, and a very-much-needed glossary, but a general index would also have been helpful.

As an attempt to deal with a number of morphologically similar species on modern lines the book is a great achievement and deserving of serious study, but the reviewer still holds that the first object of any classification is to facilitate the naming of the objects classified, and wonders whether this end will be attained by the complex methods here elaborated.

E. M. WAKEFIELD

Mushrooms in their Natural Habitats. By ALEXANDER H. SMITH. 1949. Vol. 1: text; i-viii, pp. 1-626. Vol. 2: illustrations. Portland, Oregon, U.S.A.: Sawyer's Inc. \$ 26.50.

This is something new in fungus books and one to welcome. It consists of a volume of 626 pages and a series of 33 disks each of which has 7 small coloured transparencies in duplicate. A stereoscope called a 'View-master' is also supplied. With this one can gaze on

about 230 fungi growing in their natural habitats—and very beautiful they look. The colours are not perhaps as accurate as we could wish. Blue tints have a tendency to intrude, but on the whole the photographer, W. B. Gruber, has been successful and we have a captivating glimpse of a representative selection of the fleshy fungi of North America. Three-quarters of the species photographed are to be found in Europe. To those of us who are familiar with these, the purely American species are especially interesting. Our only regret is that there are not more, but in a work of this kind only a very small proportion from each genus could be given. *Boletus*, *Amanita*, *Lepiota*, *Agaricus* (= *Psalliota*) and *Lactarius* are better represented than others. Frequently only one or two species are included. The text consists of a general introduction to the various aspects of mycology and contains much useful information. The importance of microscopic characters is stressed and there is a valuable chapter on laboratory technique. Mycophagy is the head of one section. Some remarks on poisonous fungi make us wonder if the American species are always the same as ours. For instance, it is stated that *Boletus luridus* is known to be poisonous. This is not so for the European species of this name, which is a good edible.

Most of the book is taken up with the description of the 230 species illustrated by the colour films. Each description is preceded by a 'general discussion' and to the more experienced student this is the most attractive part of the text. The nomenclature is sometimes confusing since the author has given priority to the generic and specific names used by S. F. Gray in *Nat. Arr. Brit. Plants* (1821) which is said to have been published after the first volume of the *Systema Mycologicum*. It is disconcerting to see our old friend *Nyctalis asterophora* Fr. acquiring a new look as *Asterophora lycoperdoides* S. F. Gray. Fortunately we are given synonyms of each species but some important ones are missing. *Agaricus haematospermus* (Bull.) Fr. is usually considered identical with *A. echinatus* Fr. Both were included in *Systema Mycologicum*. *Psalliota meleagris* J. Schaeffer is given as a synonym of *Agaricus placomyces* Peck but there is no mention of *A. xanthodermus* Génév. The author has adopted some of the 'new' genera which have been introduced in recent years and which bring a little more coherence into the classification of the agarics. His adoption of at least one genus may not be allowed if the International Rules are followed.—But these are questions to be threshed out by the specialists.

With some hesitation we mention the author's style which on the whole is clear and well suited to the subject, but English readers will be startled by the frequent mixing of the impersonal with the personal pronouns—always masculine! Such phrases as 'if *one* has a microscope, *he* should also have the usual accessories' or 'a table on which *one* may spread out *his* collection' or again '*one* finds *himself* confronted with' and so on, are to be found on nearly every page. We do not know to what extent this is acceptable American practice but it has long since been discarded by English authors.

This work is primarily intended for the beginner and we hope it will bring many new recruits to the ranks of American mycologists. We hope also that it is the forerunner of a more extensive work on the agarics of North America which is badly wanted to bring together the numerous species described in recent years and which the author is so well qualified to write.

A. A. PEARSON

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INSTRUCTIONS TO AUTHORS

Contributors are asked to be clear and concise, and to use a recent issue of the *Transactions* as a guide to the arrangement of headings and subheadings, explanations of plates and figures, references to the literature, and other details. Each paper should start with a short summary.

The standards adopted in the *Transactions* are those outlined in the Royal Society's pamphlet, *General Notes on the Preparation of Scientific Papers* (1950, Cambridge University Press, 200 Euston Road, London N.W. 1, price 2s. 6d.). An exception is that in the *Transactions* citations of references to literature, although based on the Harvard system, include the full titles of the papers and complete page numbers. Titles of journals are abbreviated in accordance with *A World List of Scientific Periodicals*, 1934.

The scientific names of genera and species are printed in italics and should be underlined in the typescript. The title of the paper, headings, and subheadings may be in capitals, but should not be underlined.

The attention of authors proposing new taxonomic groups is drawn to the need to give an adequate description and figure, and to designate the types as required by the *International Rules of Botanical Nomenclature*. The description of a new species should be accompanied by a figure, and whenever possible the type specimen should be deposited in one of the national herbaria.